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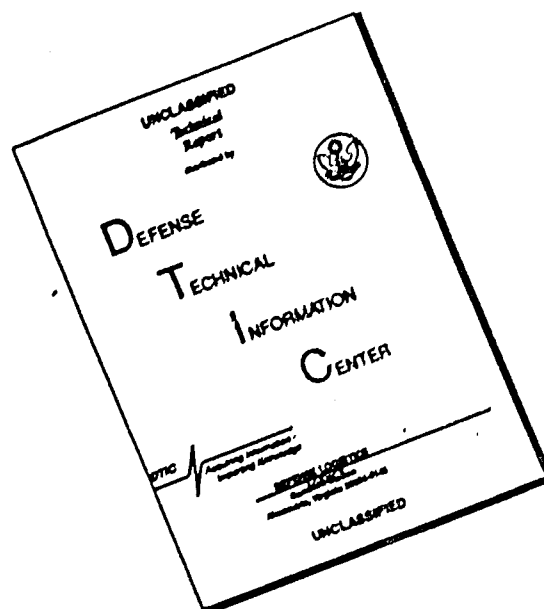DTIC
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NAVY OCCUPATIONAL TASK ANALYSIS PROGRAM

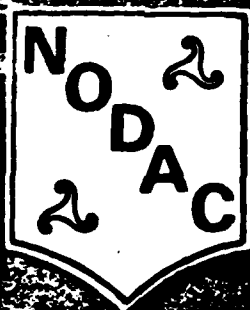HANDBOOK FOR CONSTRUCTION OF TASK INVENTORIES FOR

NAVY ENLISTED RATINGS

1984

NAVY OCCUPATIONAL
DEVELOPMENT AND ANALYSIS
CENTER

NAVY OCCUPATIONAL TASK ANALYSIS
PROGRAM DEPARTMENT
NAVAL MILITARY PERSONNEL
COMMAND

NODAC

FOREWORD

This Handbook for Construction of Task Inventories for Navy
Enlisted Ratings was produced for the Navy Occupational Develop-
ment and Analysis Center (NODAC). The objectives for developing
such a handbook were two-fold: (1) to provide NODAC with a
documented record of current task inventory development proce-
dures, to be used both as an on-the-job training resource and an
institutional memory, and (2) to identify potential improvements
to existing NODAC procedures from research, analysis, and
current practices of other job/task analysis organizations.

Funding for the development of the handbook was provided by
the Occupational Systems Department of the Naval Military Per-
sonnel Command (NMPC-5). The handbook was written by Diane M.
Ramsey-Klee, Ph.D. of R-K Research and System Design under
Contract N66001-80-C-0455 with the Navy Personnel Research and
Development Center. Marjorie H. Royle was the technical
monitor.

CDR J. K. Todaro
Officer-In-Charge
Navy Occupational Development
and Analysis Center

ACKNOWLEDGMENTS

Insight into how job and task analysis is performed in the United States Army, particularly in relation to the Instructional Systems Development (ISD) process, was provided by Bernard Silverberg, U.S. Army Training Developments Institute, Fort Monroe, VA. Darrell Worstein, U.S. Army Soldier Support Center, Alexandria, VA, contributed further useful information.

Valuable information also was provided by CAPT Ralph Anzelmo, Office of Manpower Utilization, United States Marine Corps, Quantico, VA concerning the USMC program in job and task analysis.

Two individuals from the Navy training community provided both their time and extensive resource materials and ideas for this handbook. I wish to thank John Lang, CNET (N-9), Pensacola, FL; and George Matthews, NAVEDTRA-PRODEVCEN, Pensacola, FL.

Many individuals interviewed at NODAC contributed ideas, made suggestions, and later helped work out the confusions and inconsistencies that surfaced during the final writing stage. Early guidance was provided by LCDR Harry Kellner, Director of NODAC's Data Collection Division, and ETCM Michael Bottle of this same division who authored the internal NODAC manual "Task Inventory Development Procedures," February 1981. Subsequent to their departure, LT James Pereira and PNCM Merle Krueger, their replacements, and LT Chris Holm of the Data Collection Division spent many hours in review of the draft and in consultation on changes.

My special appreciation is extended to a number of individuals who provided guidance and support throughout the project. First, to Maurice (Mike) Callahan, NMPC-5, for his early recognition of the need to document NODAC's operational procedures, and to CDR John D. Holland, previous Officer-In-Charge of NODAC, for his support in carrying out the initial intent of the contract. CDR Jeanne K. Todaro, the new Officer-In-Charge of NODAC, encouraged a climate favorable to the introduction of innovations and changes that would benefit the way that NODAC fulfills its mission. Hopefully, this handbook has kept faith with the expectations of all these individuals who had a stake in the outcome.

My final acknowledgment of credit due goes to Marjorie R. Royle, Navy Personnel Research and Development Center (NPRDC) as the technical monitor on this contract for her always timely response to a multitude of requests for references, clarifications, and guidance. Other valuable insights were provided by Dr. John J. Pass, NPRDC and currently Technical Director of NODAC, through his assessment of survey sampling strategies and rating scale design, and his understanding of the potential contribution of the contents of CNET training importance surveys to the design of future NODAC occupational surveys.

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  System Design
Malibu, California

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RECORD OF CHANGES

CHANGE NUMBER	DATE OF CHANGE	DATE ENTERED	BY WHOM ENTERED

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HANDBOOK FOR CONSTRUCTION OF TASK INVENTORIES

FOR NAVY ENLISTED RATINGS

CHAPTER 1

INTRODUCTION

INTRODUCTION

The primary objective of the Navy Occupational Development and Analysis Center (NODAC) is to collect, process, and analyze occupational information about the job content of enlisted ratings and officer specialties in the United States Navy. This information is used as the major basis for making decisions related to the occupational classification structure of the Navy, the design of training curriculums, enlisted advancement requirements, manning determinations, and future manpower/hardware interface requirements. The procedures followed by NODAC in conducting occupational analysis for the most part have gone undocumented, with the notable exception of a recent manual describing "Task Inventory Development Procedures" (February 1981). This procedural guide was prepared by NODAC to meet two needs. First, the loss of an experienced task inventory developer can have a serious negative impact on NODAC's program in that the expertise acquired by this individual is no longer available either in written or spoken form. Further, there is a need to train new people, as they are hired or transferred into NODAC, in the basic information and techniques required in task inventory development. In the past, this training has been accomplished primarily by on-the-job experience.

Purpose

The purpose of this handbook is two-fold. First, it presents a general structure for documenting all of the occupational survey and analysis procedures performed by NODAC. Second, it documents in detail the first stage of the NODAC enlisted occupational survey and analysis process. Not only are current procedures documented, additional procedures used by other military services and government agencies are described as well where they could prove to be of benefit to NODAC. The long-term objective is to develop a handbook or set of handbooks that can be maintained and updated on a periodic basis to incorporate new knowledge and techniques, in order to provide the best current information and guidance to NODAC task inventory developers and occupational analysts.

Scope

Figure 1-1 presents a flowchart of the NODAC occupational survey and analysis process for enlisted ratings. The overall process can be broken down into three major stages: (1) construction of a NODAC task inventory for a particular enlisted rating, (2) administration of the inventory to a sample of job incumbents in the rating being surveyed and processing of responses to the inventory using the Comprehensive Occupational Data Analysis Programs (CODAP), and (3) analysis of the response data and preparation of reports containing the findings of the occupational survey.

STAGE 1

Construct NODAC Task Inventory

- Research and Work-Up of Information
- Prepare for and Conduct Observations and Interviews (O&I)
- Inventory Construction and Review.

STAGE 2

Task Inventory Administration and CODAP Processing

- Prepare for and Administer Task Inventory
- Screen and Verify Responses
- Input Data into Computer
- Manipulate Data with CODAP Programs and Obtain Printouts

STAGE 3

Analysis and Reports

- Send Standard CODAP Package to Navy Training Community Users
- Analyze the Data and CODAP Printouts
- Prepare NODAC Occupational Brief
- Provide NODAC Reports and Briefings to NODAC Consumers

Figure 1-1. Flowchart of the NODAC Enlisted Occupational Survey and Analysis Process.

To conduct occupational surveys and perform occupational analysis, NODAC is organized into five divisions. Figure 1-2 shows the NODAC table of organization, which includes divisions to conduct both enlisted and officer surveys, automated data processing, analysis, and development and updating of occupational standards. Three divisions are directly involved in the enlisted occupational survey and analysis process. The stages at which each of these three divisions comes into play are also shown in Figure 1-2.

Ideally, handbooks documenting the procedures for each of the three stages in developing surveys of enlisted ratings as well as a handbook for development and analysis of officer surveys should be prepared. The scope of this first handbook is to document Stage 1—Construction of Task Inventories for Navy Enlisted Ratings. A companion handbook for Stage 2—Task Inventory Administration and CODAP Processing—is being prepared by NODAC.

Organization of Handbook

This handbook is organized into seven chapters plus six appendices. In addition, an extensive annotated bibliography is included after Chapter 7.

A background chapter follows this brief introduction. In it, occupational analysis in the military and civilian sectors is reviewed; a working terminology for job task analysi .s established; and basic issues i task inventory development are discussed.

Chapter 3 describes past and present uses of data produced by the Navy Occupational Task Analysis Program (NOTAP) of NODAC. Historical consumers as well as recent new consumers are described. Chapters 2 and 3 are concerned with presenting historical background and philosophical issues in occupational analysis. The reader who wants to move right into a discussion of the task inventory construction process itself may skip Chapters 2 and 3. However, newcomers to task inventory development and those who desire a deeper understanding of the occupational analysis field in the military and civilian sectors should read these two chapters.

Chapters 4 through 7 present a detailed "How To" description of the various phases in developing a NOTAP task inventory booklet. An overview of task inventory development is presented first in Chapter 4. Then in Chapter 5, the first phase of task inventory development, research and work-up of information, is described. The second phase, preparation for and conduct of observations and interviews of job incumbents in the rating being surveyed, is explained in Chapter 6. In Chapter 7, the user of this handbook is guided through the third phase, an explicit set of procedural steps for developing and reviewing the task inventory booklet prior to printing and administration to ship and shore commands.

An annotated bibliography of approximately 75 publications in the field of occupational analysis is included after Chapter 7. Each reference includes a complete citation as well as a brief description of the contents of the publication. From these descriptions, the reader may choose those publication of enough interest to read in full.

10 August 1984

Enlisted Occupational Requirements Department

Head - GM13 Code 20
Assistant Head - LCDR Code 21

Admin Support Code 20A
LT
PN1
GS-4/5

Weps/Elec/Eng Div. Code 201
Division Head
GS-12

- Asst. to Div. Head GS-12
- LCPO Senior E8
- Team: PTCS, STCS, TMCS, MNC / ENC, BTC, HTC

Aviation Division Code 202
Division Officer
LCDR

- Asst. to Div. Off. GS-12
- LCPO Senior E8
- Team: AECS, AOC, ADC, AMHC / ATC, AQC, AX1

Ops/Support Div. Code 203
Division Officer
LCDR

- Asst. to Div. Off. GS-12
- LCPO Senior E8
- Team: DSCS, FTCS, OSCS, RMC / SKC, BM1, OT1

TIS/Support Div. Code 204
Division Officer
LT

- Asst. to Div. Off. GS-12
- LCPO Senior E7/E8
- Mailroom: ENC, ARF1, DP2

The six appendices to this handbook provide reference materials of value to Navy task inventory developers. Appendix A contains a glossary of job task analysis terms with accompanying definitions. In Appendix B, definitions for common acronyms used in job task analysis are provided. A list of standard NODAC action verbs with accompanying definitions is presented in Appendix C. In Appendix D, specific guidelines for writing task statements are provided along with practice exercises. Appendix E contains specific instructions and training materials for conducting job analysis interviews. Six alternative techniques for task inventory development that may be appropriate to try out, depending on the nature of the rating being surveyed, are described in Appendix F.

HANDBOOK FOR CONSTRUCTION OF TASK INVENTORIES

FOR NAVY ENLISTED RATINGS

CHAPTER 2
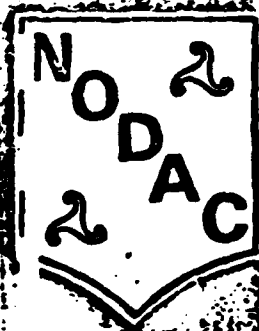
BACKGROUND

Analysis of the world of human work provides information needed to prepare job descriptions, to devise occupational classification structures, and for·decisions on the curriculum content of training programs. The level of detail required to perform each of these functions dictates the speci-. ficity needed in the occupational analysis and influences the choice of an analysis method. The primary source of job data usually is the job holder at the work site and sometimes this individual's immediate supervisor. In this chapter, the history of occupational analysis in the military and civilian sectors is reviewed, the terminology of job task analysis is introduced, and ·basic issues in task inventory development are discussed.

Occupational Analysis in the Military

The occupational analysis approach, or one of its variations—job analy- ·sis or task analysis, is now used by all branches of the military in the United States. It has also been used by the armed forces in Canada, Aus- tralia, and Great Britain. This wide use has encouraged the evolution of occupational analysis concepts and the sharing of survey methodology and analytic techniques. A common denominator in much of this work is the package of currently some 50 computer programs collectively called CODAP (Comprehensive Occupational Data Analysis Programs).

Air Force research into procedures for conducting job analysis by means of occupational surveys dates back to 1961 (Morsh & Archer, 1967). In 1970 the Air Training Command Occupational Survey program was combined with the USAF Occupational Testing program of the Air Force Human Resources Laboratory (AFHRL). This merger was redesignated the USAF Occupational Measurement Center (USAFOMC) in 1974. AFHRL was responsible for the initial development of CODAP, the primary set of statistical programs now used by all military services in the United States in analyzing task data. Ongoing development and refinement of the Air Force version of CODAP, which runs on UNIVAC computing equipment, has been performed by AFHRL since the initial avail- ability of CODAP in 1963. Occupational surveys of Air Force enlisted and officer specialties continue to be performed by the USAF Occupational Mea- ·surement Center. USAFOMC currently uses a job inventory booklet that in- corporates scannable columns for marking responses. USAFOMC job inventories are administered to job incumbents at their job sites by occupational survey control officers.

The Navy Occupational Task Analysis Program (NOTAP) is a Naval Military Personnel Command (NMPC) program whose primary objective is the collection, processing, and analysis of occupational information about the job content of Navy ratings (specialties). The collective term for this function is job task analysis (Callahan & Rosenthal, 1977, p. 20). NOTAP's beginnings can be traced back to early 1966 when the Secretary of the Navy's Task Force on ·Navy/Marine Corps Personnel Retention recommended personnel research be

undertaken through the vehicle of a five-point manpower management project that included billet analysis. In the same year a Management Information System Task Force was also established, one of whose goals was the creation of an occupational databank. Exploratory development research began in FY 1967 and advanced development funding was applied in FY 1969. Callahan and Rosenthal (1977) record that "the job analysis programs of the other military services, government agencies, and civilian industry were analyzed, various methods of collecting and processing data were considered, and an introductory approach to the collection and analysis of Navy occupational data was adopted" (p. 20).

Upon the successful completion of the task analysis exploratory development effort, task analysis techniques were applied to assist in improving the utilization and training of Naval enlisted personnel in the aviation ratings. On 1 July 1973, the Navy's occupational task analysis effort was transferred from the Naval Personnel Research and Development Laboratory to the Navy Personnel Program Support Activity and assumed operational status as NOTAP. On 1 March 1976, NOTAP and the Navy Occupational Standards Department were consolidated to become the Navy Occupational Development and Analysis Center (NODAC).

NOTAP continues to be the Navy's system for performing job task analysis. Data collection is accomplished using a job task inventory questionnaire. The process of developing the task inventory instrument is described by Callahan and Rosenthal (1977) as follows.

> Initially, data collection team members use secondary sources of job data, such as Occupational Standards, NEC [Navy Enlisted Classification] manuals, and rate [level of proficiency] training manuals to familiarize themselves with the work content of the rating [occupation].... The primary source of job data, however, is the man at the job site. Accordingly, the primary input to the task inventory takes place during the observation and interview of job incumbents [job holders] at the work site. Data collection team members then consolidate their findings and produce a job task inventory to be administered by NOTAP team members to a representative sample of personnel in the rating under study. (p. 21)

At the present time, all Navy ratings have been surveyed. To insure that decisions are made based on current data, ratings are resurveyed on a four-year cycle. The previous survey instrument is used as the basis for the resurvey, after it has been updated by means of on-the-job-site interviews.

After the NOTAP task inventory booklets have been team administered to a representative sample of job incumbents in the rating under study, supplemented by a mail survey of job incumbents who are not accessible to on-site administration (in order to increase the representativeness of the survey sample), respondent data provided on a separate response packet are subjected

to an optical scanning operation that trancribes the data to magnetic tapes. The tapes then are processed by the Navy's version of CODAP which runs on IBM computing equipment. Development of an enhanced CODAP System 80 currently is being sponsored by the DoD Executive Agent for Joint Task Analysis Support because of limitations in the existing IBM CODAP system that the Navy, Marine Corps, and Coast Guard have been using. The new system will have more analytic power and flexibility, a more user-oriented display capability, and increased transportability to other DoD agencies.

The Marine Corps task analysis program is similar to NOTAP. USMC task analysts develop a job task inventory booklet based on the previous survey instrument, observation and interview at three to four different locations covering all pay grades, and the input of subject matter experts. USMC task inventories are team administered at the job site, and analysis of respondent data is performed on the basis of percentage of time spent on each task by processing the data through the IBM version of CODAP.

The Coast Guard has been conducting occupational surveys with job inventories patterned after those used by the Air Force. The Coast Guard uses a mail survey procedure for collecting occupational data by means of a task inventory questionnaire rather than administering the occupational survey to job incumbents at their job sites. Questionnaires are developed at Coast Guard service schools and reviewed by senior personnel in the ratings before mail-out. Inventory returns historically have been processed by a system of the Coast Guard's own devising in combination with the IBM version of CODAP.

The Army's activities in occupational analysis are provided by two programs. The Occupational Survey Division of the U.S. Army Soldier Support Center conducts occupational surveys for traditional job analysis purposes to support decisions about the Military Occupational Specialty (MOS) classification structure employed by the Army. A mail survey procedure is used to collect occupational data which have been analyzed by the UNIVAC version of CODAP since 1973. Prior to 1973, occupational data were analyzed by a system devised by the Army. The other Army occupational analysis program is the conduct of training task analysis. The Army Training Developments Institute provides assistance to Army service schools and training centers in pursuing a systematic approach to instructional curriculum design. This assistance takes the form of guidelines, procedural handbooks, instructional modules for learning job and task analysis methods, and job performance aids.

Most of the military occupations in the Canadian Forces have been surveyed using occupational questionnaires. The items contained in Canadian questionnaire booklets are presented simultaneously in both English and French, and responses are marked on a separate response packet. As more members of the Hispanic or other ethnic minority populations are recruited into the armed forces, bilingual occupational inventories may become an option to consider in this country as well. Administration of Canadian occupational surveys is supervised by personnel from the Directorate of Military Occupational Structures because their questionnaires are long and complex, requiring three and one half hours to complete. The Canadians have modified the IBM version of CODAP to meet their needs and added other programming features tailored to their application. They currently are testing the new CODAP System 80 as a potential improvement over their existing

computer analysis capability. A Canadian Forces-U.S. Air Force exchange program in occupational analysis has recently been established.

The task analysis program of the British Royal Navy is structured similarly to that of the U.S. Navy. They use the IBM version of CODAP to analyze response data to their task inventories and have expressed interest in the new CODAP System 80 as a vehicle to upgrade their computer analysis capability. Training management systems at three of the Royal Navy's apprenticeship training establishments have been studied using CODAP to analyze data gathered by questionnaire.

The Australian Armed Forces have developed many task inventories. These survey instruments generally are patterned after those used by the U.S. Air Force. One CODAP processing center located in Canberra analyzes task inventory response data for all branches of the Australian Armed Forces--the Army, Navy, and Air Force. In each of the three services, an occupational analysis section develops survey instruments tailored to the unique features of that branch of the Australian military. A standardized method of administering these surveys to job incumbents at the job site is followed. In addition to the routine administration of periodic occupational surveys, special occupational studies are also conducted using CODAP. Officers from the Australian Armed Forces are assigned to tours of duty working with the U.S. Air Force occupational research program.

The CODAP-based military job analysis systems described above have had their greatest impact on personnel and training programs in terms of providing an occupational information database and systematic analysis of that database to assist managers in making decisions concerning how jobs are structured, how they should be organized and defined, and what training is both necessary and relevant.

Occupational Analysis in the Civilian Sector

The civilian sector has not experienced as much urgency or impetus to systematize occupational analysis procedures as has the military sector. McCormick (1976) in his review of the early study of human work concluded that "Of the various deficiences of conventional job analysis procedures, probably the sharpest criticism is that the typical essay descriptions of job activities are not adequately descriptive of the jobs in question, especially in the case of jobs that deal primarily with decision and communication activities..." (p. 654). Earlier practices of the United States Training and Employment Service typify conventional job analysis procedures in which the job analyst's skill in verbally describing the job as it exists in its actual setting determined the validity and usefulness of the job description. Subsequently, the United States Training and Employment Service shifted to a functional occupational classification approach, the results of which are reflected in the current edition of the Department of Labor's Dictionary of Occupational Titles (1976). Data contained in the job definitions in this dictionary include information on WHAT gets done, HOW it gets done, and WHY it gets done. In addition, individual occupations are incorporated into a classification structure identified by a 6-digit code number. Other

developments in occupational analysis in the civilian sector have involved the use of structured questionnaires or taxonomies such as the Position Analysis Questionnaire (PAQ), which provides for the analysis of jobs in terms of worker-oriented job elements (McCormick, Jeanneret, & Mecham, 1969), and the Occupation Analysis Inventory (OAI), which provides more descriptive specificity than the PAQ while retaining applicability to the entire occupational·spectrum (Cunningham, Tuttle, Floyd, & Bates, 1971). One current research approach in this area is to develop a relatively short inventory that will be applicable to a range of jobs.

An important recent contribution to a systematic and quantitatively oriented approach for developing more effective procedures to identify valid and necessary curriculum content has come from The Center for Vocational Education at The Ohio State University. An extremely readable five-volume description of procedures for constructing task inventories, surveying the task performance of civilian occupations, and analyzing survey data to aid curriculum planners and developers in determining the appropriate performance content for job training has resulted from this Center's programmatic research effort (Ammerman & Pratzner, 1977). The procedures are intended to be of value to both occupational curriculum personnel and those persons concerned with noncurriculum issues of occupational description and updating of job content information.

The Bureau of Intergovernmental Personnel Programs (BIPP) of the U.S. Civil Service Commission (now the Office of Personnel Management) has issued a set of three publications providing guidance to state and local governments in conducting job analysis for a variety of purposes in the civilian sector. One of these publications (Job Analysis: Developing and Documenting Data, 1973) is a guide to preparing for and conducting a job analysis. Examples of how the job analysis can be used are also included in this reference. The Office of Personnel Management (OPM) has taken a quite different approach to task analysis than that followed by the military. This civilian agency typically uses complex, multi-part task statements that would be difficult to analyze by CODAP, and does not subject its task response data to any computer analysis. The present level of analysis consists of using task data to write position descriptions. Recently OPM has experimented with the use of CODAP in cooperation with NODAC.

The most recent adaptation in the civilian sector of the U.S. Air Force CODAP approach to occupational analysis has been accomplished by Prince George's County, Maryland. This county government has developed a computerized method of job analysis for personnel management called "TI (Task Inventory): CODAP" through a process utilizing task inventories descriptive of the total work domain to determine the specific tasks performed by each county employee (Gambardella & Alvord, 1979). The motivation for this effort was the usefulness of a systematic method of job analysis for many different areas of personnel administration, including job classification and pay, more efficient work assignment and distribution, recruitment, performance evaluation, job training, and productivity. The "TI: CODAP" manual developed by this Maryland county agency is intended to provide an understanding of CODAP methodology and detailed instructions for the system's installation for those administrators in other jurisdictions who are serious about using CODAP to construct a systematic approach to their personnel management operations.

The Terminology of Job Task Analysis

The terminology of job task analysis reflects a hierarchical taxonomy of human work. In a hierarchical taxonomy of human work, occupational components are classified into a graded arrangement that reflects levels of specificity starting from the very general and going to the more specific, with the specific always being included in the general. The hierarchical arrangement starts with an occupational field as the most general level and progresses through the job level to several levels of greater specificity. Figure 2-1 shows the progression from the most general level to the most specific level in the Navy enlisted occupational hierarchy. In Navy enlisted job task analysis, the next most general level after the occupational field itself is a rating within an occupational field. Sometimes closely related jobs within a rating are grouped into a job community or job cluster. If this is the case, then the job community/cluster becomes the third most general level in the hierarchy. Moving down through the hierarchy, the job then becomes the next level. Duty categories are the major subdivisions of a job. Within duty categories, tasks constitute the next most specific level of behavior in a job. Duty categories provide a meaningful way to organize task statements so that both the inventory respondent and the occupational survey analyst have a structured and logical way to look at jobs. A task element is a subdivision of a task whose level of complexity is directly subordinate to the task itself; sometimes called a subtask (Air Force usage). The Navy enlisted occupational hierarchy, then, starting from the most general term and going to the most specific term, is OCCUPATIONAL FIELD, RATING, JOB COMMUNITY/CLUSTER, JOB, DUTY, TASK, and TASK ELEMENT.

Appendix A contains a glossary of job task analysis terms in common usage. Because of their central importance to this handbook, certain definitions in the glossary are repeated here that pertain to the Navy enlisted occupational hierarchy.

OCCUPATIONAL FIELD

A group of persons who are engaged in closely related occupations (professions and/or vocations). The allied health care field, for example, consists of physicians, nurses, nurse practitioners, medical technicians, medical therapists, orderlies, etc. Examples of Navy enlisted occupational fields are administration, construction, marine engineering, aviation maintenance/weapons, and ship maintenance.

RATING

An enlisted occupational specialty in the Navy made up of duties calling for closely related skills, knowledge, abilities, and aptitudes. The rating is the basic occupational unit used in carrying out the personnel actions of selection, training, classification, and assignment.

JOB COMMUNITY/CLUSTER

A group of persons who perform identical or closely related jobs within a rating. Job communities are characterized by NECs, primary duties, systems or equipment, skill levels, platforms, and any unique features of the family of tasks involved. In the Navy, service ratings are one example of job communities.

JOB

The duties and tasks performed by a single worker constitute his or her job. If identical duties and tasks are performed by several individuals, they all hold the same job.

DUTY

One of the major subdivisions of work performed by one individual, generally performed according to a prescribed method to meet a set standard. One or more duties constitute a job. A duty normally exists in one functional ar a and is characterized as follows: (1) it is a recognized segment of a job that occupies a principal portion of a job incumbent's work time, (2) it occurs repeatedly and/or frequently in the work cycle, and (3) it involves work requiring closely related skills and knowledge.

TASK

A unit of work that occupies a significant portion of work time spent in the performance of a duty. It is the most specific level of behavior in a job and describes the performance of a meaningful job function in terms of a specific action applied to a particular object. The behavior must be observable, have a definite beginning and end, and result in a completed work action or a measurable work product.

TASK ELEMENT

A subdivision of a task whose level of complexity is directly subordinate to the task itself. A task element is a distinct and constituent part of a task, constituting a logical and necessary step in the performance of the task. Performing a task element does not result in a completed work action or a measurable work product. It is the smallest unit of work contained in the job that is considered in job task analysis. Sometimes called subtask (Air Force usage).

OCCUPATIONAL FIELD
(e.g., Naval Aviation
Maintenance/Weapons)

RATING
(e.g., AD, AE, AM,
AO, AQ, AT,...)

JOB COMMUNITY/CLUSTER
(e.g., Carrier Flight Deck Aircraft
Handling Operations, the ABH
Service Rating in the AB Rating)

JOB
(e.g., Bridle
Arrestor Operator
in the AB Rating)

Duty 1
(e.g., Inspecting
Bridle Arrestor)

Duty 2
(e.g., Maintaining
Bridle Arrestor)

Duty N
(e.g., Operating
Bridle Arrestor under
Launch Conditions)

Task 1
(e.g., Measure
bridle arrestor
brake disc wear)

Task N
(e.g., Remove/replace
bridle arrestor
system components)

Task Element 11
(e.g., Calibrate
measuring
instrument)   12   13

Task Element N1
(e.g., Remove
brake disc)   N2   N3
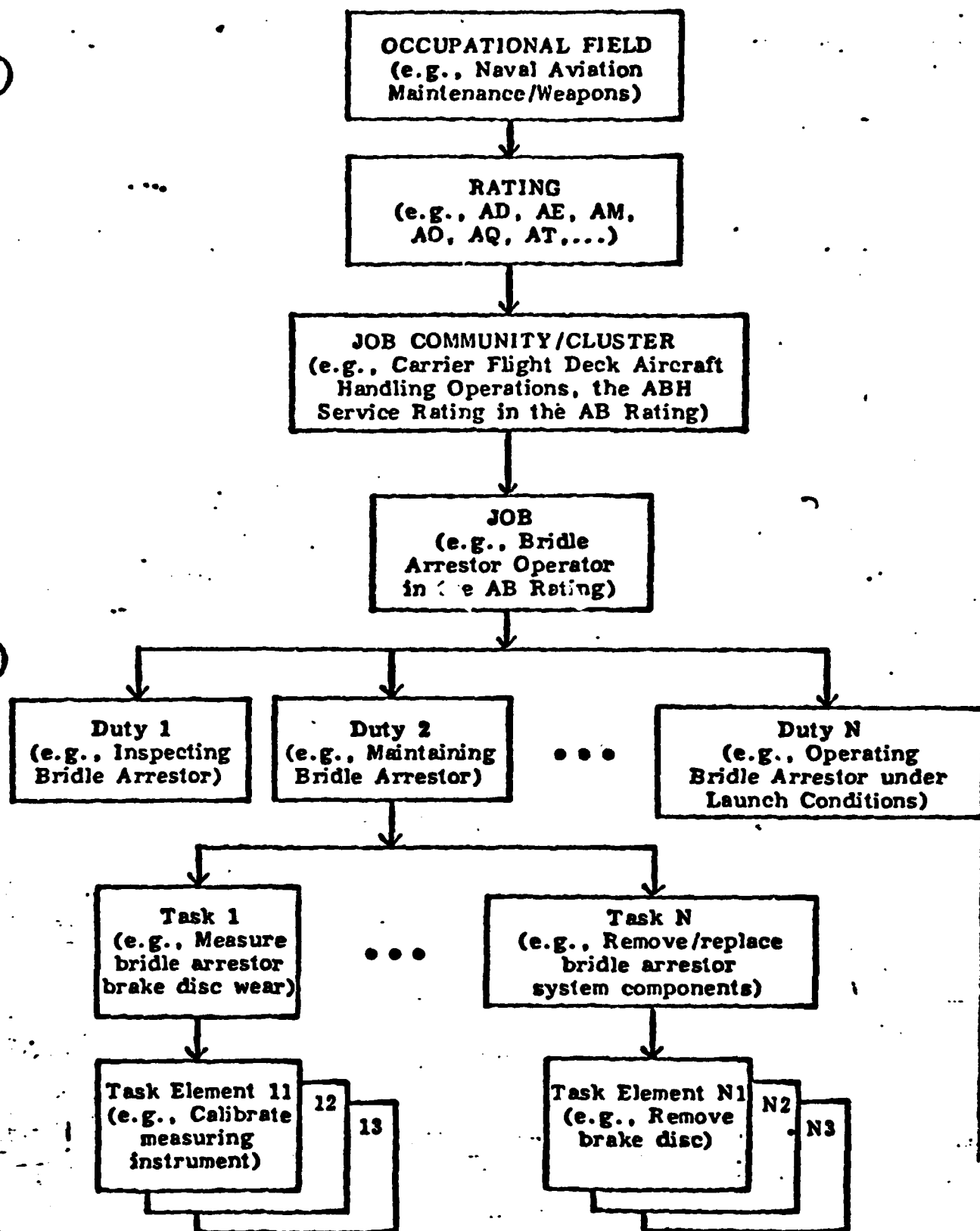
Figure 2-1. Navy Enlisted Occupational Hierarchy Showing the Progression
from the Most General Level to the Most Specific Level.

Proficient job performance is dependent on the skills and knowledge that a job incumbent possesses. Job task analysis terms pertaining to acquired skills and knowledge are defined in the glossary of Appendix A as follows.

SKILL

A set of related physical and/or mental competencies capably applied to a specific task or group of related tasks. A skill requires considerable precision and is learned through extensive practice and study. It may be applied to several tasks or jobs with little or no transfer of training required. A skill implies proficiency which is measured by quality or quantity task performance criteria.

SKILL LEVELS

The proficiency levels (apprentice, journeyman, supervisor, and manager) of task performance.

KNOWLEDGE

A substantial amount of related information that can be recalled with or without the aid of documentation. Knowledge is distinguished from small amounts of unrelated pieces of information that can be rapidly learned. Knowledge in itself is not a skill, but a prerequisite for the application of skills. Skills may require recall of knowledge.

Stating the tasks of a job accurately and comprehensively helps insure that the list of task statements in a job task inventory questionnaire, used to solicit responses from job incumbents, will provide complete occupational data. Construction of good task statements is critical to the success of any job task survey. Statements of tasks should follow a certain grammatical structure, conform to certain rules, and use terminology that is generally current and meaningful to persons working in the job. Brevity and clarity are the foremost considerations. Job task analysis terms pertaining to the construction of task statements are defined in the glossary of Appendix A as follows.

OCCUPATIONAL STANDARDS

The minimum standards for tasks required of enlisted personnel within specific occupational entities (ratings and rates).

TASK STATEMENT

The statement of a task is composed of three basic elements: (1) a specific action verb, descriptive of what is done; (2) a brief identification of what is being acted upon--the object of the action verb; and (3) whatever qualifying phrases that may be needed to clearly distinguish the task from related or similar activities, to limit and define the scope of concern, or to communicate unambiguously what task it is.

ACTION VERB

An action verb is one of the basic elements of a task statement and is descriptive of what is being done in the task. The action verb usually is in the present tense (e.g., repair), although it sometimes appears in the gerund form (e.g., repairing). The subject of the action is understood to be "I" so that the task statement unambiguously refers to what the respondent does on the job.

Many other job ta... analysis terms are defined in the glossary of Appendix A. The reader is referred to this glossary for definitions of additional terms as they occur in this handbook. Definitions for common acronyms used in job task analysis are contained in Appendix B.

Basic Issues in Job Task Inventory Development

A number of basic issues in job task inventory development have not been resolved and continue to complicate decisions about how best to design occupational survey instruments. These basic issues are discussed below.

Specificity. Probably the most basic and thorniest issue in job task inventory development is the question of the level of work specificity at which task statements should be written. The level of specificity or detail that is appropriate for the task statements of a job task inventory questionnaire or occupational survey is dependent on the purpose for which the statements will be used. Greatest specificity is needed for making decisions about the curriculum content of training programs. More general statements are suitable for purposes of occupational description.

Figure 2-2 illustrates this specificity continuum for Navy enlisted job task analysis, going from the least requirement for specificity (occupational description) to the most (training task analysis). At the specificity level of occupational description, Navy enlisted occupational standards define what work job incumbents should be performing in a particular rating. At the level of job task analysis, occupational data are collected on what work job.

SPECIFICITY

Least ←——————————→ Most

Occupational Description

| Navy Occupational Standards |

25-30 task statements for each pay grade of an enlisted rating, organized under 5-10 standard topic titles. Define what work job incumbents should be performing in a particular rating. USES: Development of personnel advancement requirements and advancement in rate exams, rate training manuals, correspondence courses, and "A" and "C" school curriculums; enlisted distribution and detailing; rating review board deliberations.

Job Task Analysis

| Navy Occupational Task Analysis |

250-600 task statements for any given enlisted rating contained in a NOTAP job task inventory questionnaire. Provides occupational data on what work job incumbents actually are performing in a particular rating. USES: Recruitment, selection, assignment, occupational description, rating structure and classification systems management, revision of occupational standards, "A" and "C" school curriculum design, manning requirements/determinations, personnel research.)

Training Task Analysis

| Navy Training Task Analysis |

Thousands of detailed, non-surveyed items for developing or updating a training curriculum. From this list are selected for training those tasks and their elements that meet the learning objectives. A recent program to conduct training importance surveys, as an adjunct to NOTAP survey data, provides valuable input for training curriculum decisions. USES: Establishes or updates the training curriculum for a particular course. 1979- TES initial efforts)

Figure 2-2. Specificity Continuum for Navy Enlisted Job Task Analysis.

incumbents actually are performing in a particular rating. If there is not a good match between what job incumbents should be doing and what they actually are doing, the discrepancy needs to be resolved. One possible explanation might be that there is a manning shortage at certain pay grades that caused job incumbents to be performing tasks either above or below their rates. A second possibility might be technological change in which the introduction of new technology in a rating has not yet been reflected in the instructional curriculums for "A" and "C" schools for that rating.

The product of job task analysis is one of the points of departure for training task analysis--the job analysis activity requiring the greatest level of specificity. Job task analysis computer printouts from NOTAP are used for assistance in the training task analysis process. Thousands of detailed task items may be written as candidates for a training task inventory, particularly for the high technology ratings that involve a wide spectrum of complex equipment and systems. However, conducting a comprehensive training task analysis is both costly and time-consuming. In addition, many of the elements identified during the detailed analysis are not selected for inclusion in the training curriculum. Therefore, an alternative approach to gathering the information needed to design an appropriate instructional curriculum has been developed. Targeted training importance surveys now are being admini-tered to supplement traditional NOTAP surveys in pinpointing tasks, skills, and knowledge requiring training emphasis.

A specific example of the specificity continuum going from enlisted occupational standards through NOTAP task statements to training objectives is illustrated in Figure 2-3. At the least specific level of detail, an enlisted occupational standard might be stated as "Tune a gasoline engine." This occupational standard might be broken down into the three task statements shown in Figure 2-3. The second of these task statements, "Gap spark plugs," might further be broken down into a set of learning objectives for properly gapping spark plugs, three of which might be the ones shown in Figure 2-3.

The level of specificity required in an enlisted occupational survey varies, depending on the nature of the work of the rating. For example, the administration and handling of classified materials may be a duty category for the Yeoman rating and occupy a much larger percentage of time than for other enlisted ratings where compliance with security procedures represents a much smaller commitment of time. In the civilian sector, for example, "Clean up the work area" might be a specific task for a secretary or a mechanic. However, for janitors or clean-up personnel, the activity might represent a much larger work function.

Developing a task inventory in which all statements are equal in specificity may be a theoretically laudable but practically impossible undertaking. As far as possible, however, all task statements in a task inventory should be written at the same level of work specificity. Deviations from this goal should be based on the level of specificity needed in a given work situation to adequately describe the tasks performed.

SPECIFICITY

Least ← → Most

ENLISTED OCCUPATIONAL STANDARDS

1. Tune a gasoline engine

NOTAP TASK STATEMENTS

1. Change spark plugs
2. Gap spark plugs
3. Check timing
• • •

TRAINING OBJECTIVES

1. Use publications to identify spark plug
2. Determine size of wrench needed
3. Determine proper gapping
• • •
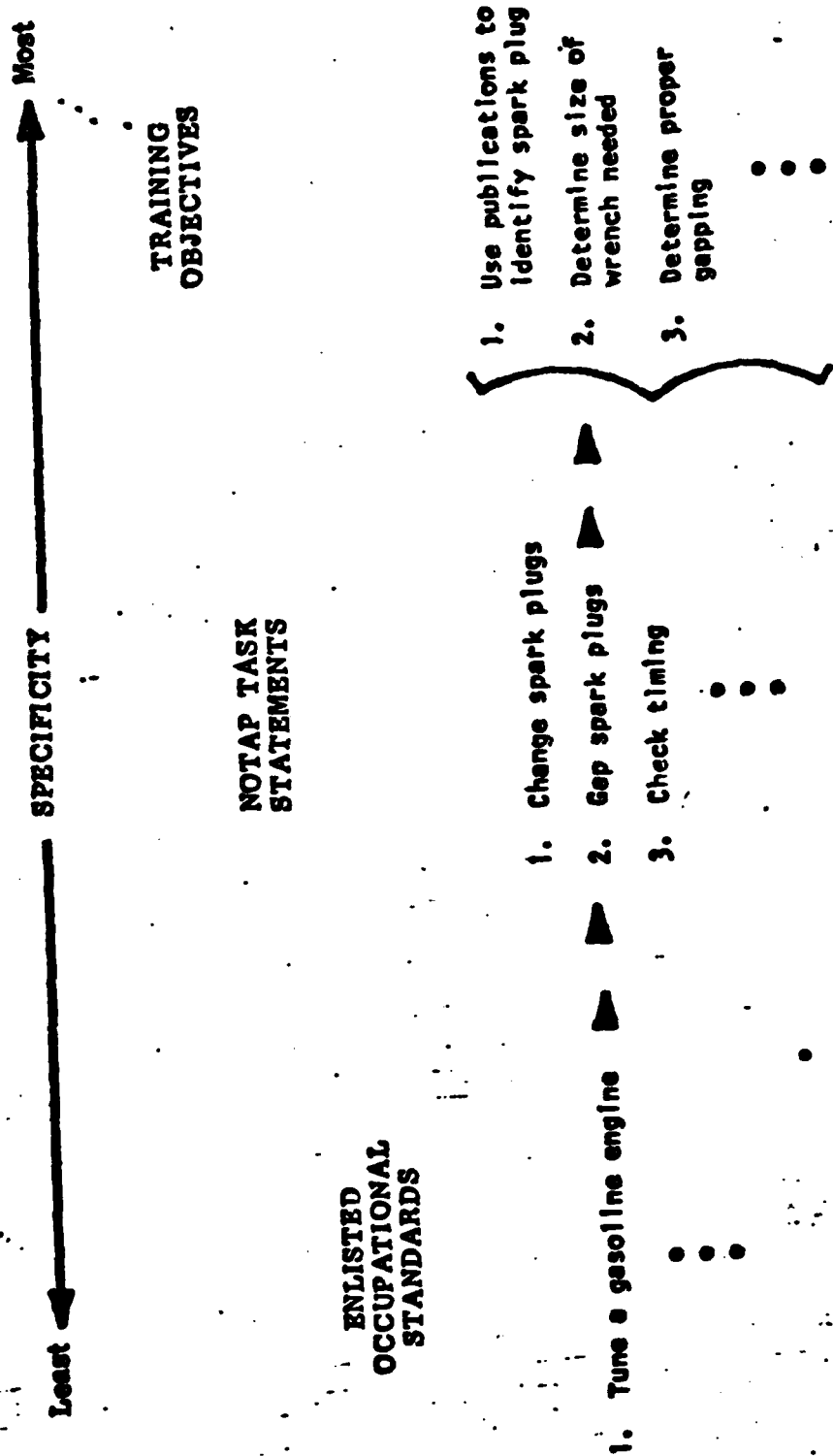
Figure 2-3. Example of the Specificity Continuum Going from Enlisted Occupational Standards through NOTAP Task Statements to Training Objectives.

The fundamental question in determining an appropriate level of specificity is, Can one task inventory serve all of the purposes or uses enumerated in Figure 2-2? Cost considerations dictate that a number of purposes should be served by a single occupational survey, and certainly the amount of effort and time required by operating forces to provide job data should be kept to a minimum. While it seems highly advantageous to attempt to serve all masters with a single occupational survey instrument, a number of considerations place constraints and limitations on how much detailed task data can be collected during the administration of a job task inventory questionnaire. The specificity at which task statements can be written is largely determined by the overall length of the inventory, the amount of time available for its administration, and the good judgment of the inventory developer.

Inventory Length. Although the Navy training community has a need for a greater level of specificity in how task statements are constructed, two constraints have mitigated against administering lengthy task inventory questionnaires. The first of these constraints is the fatigue factor. Two hours is about the limit that a respondent to a task inventory booklet can be expected to provide accurate, complete, and reliable job data. A longer period of time spent in responding to an inventory tends to induce boredom and fatigue with consequent negative effects on the quality of responses obtained. Furthermore, it is not desirable to keep individuals away from their jobs for more than two hours.

The second constraint involves limitations on the number of task statements and number of respondents that can be processed at one time by the version of CODAP in use. In the new CODAP System 80, the maximum number of inventory items possible overall has been increased from 2000 to 5000, and the number of respondents that can be accommodated in a single analysis is constrained only by the storage limitations of the computing equipment being used. Older versions of CODAP have more severe limitations.

With newer versions of CODAP being able to analyze up to 5000 inventory items, the issue of optimum inventory length in relation to human factors becomes important. One study in the literature suggests a promising approach for including as many inventory items as desired while at the same time minimizing the time demands on inventory respondents. In an evaluation of the Marine Corps task analysis program, an experimental design is given for dividing a lengthy task inventory into a series of shorter, overlapping inventories (Kishi, 1976, pp. 76-80). The purpose of the mini-booklet inventory method is to reduce the total number of task statements to which any one job incumbent has to respond, that number depending upon the number of mini-booklets chosen in the experimental design. Thus, the time required to complete the inventory is greatly reduced and the job incumbent is less likely to become bored, inattentive, or unmotivated to provide accurate responses. The overlap of task statements in each small inventory booklet is designed to provide adequate samples of response to each item.

<u>Inventory Comprehensibility</u>. A significant proportion of Navy recruits have reading skills well below the reading difficulty level of the written materials they will encounter in training and their daily work (Duffy & Nugent, 1978). Some naval enlisted personnel, especially those in the non-designated ratings and those in some of the service ratings, may not be able to read task inventory questionnaires with sufficient comprehension to understand them fully. Therefore, it becomes essential to consider ways that task inventories can be written as clearly as possible to increase their readability. Short words should be used in preference to long words or expressions. Task statements should be as brief as possible and phrased unambiguously. Unusual words, shop talk, and technical jargon should be avoided.

Not only should task inventory items be readable for all respondents, instructions or directions for responding should be equally comprehensible. There is some evidence that this is not generally the case. In a study of the readability of the Position Analysis Questionnaire (Ash & Edgell, 1975), the directions were measured by four readability indexes. Using the Flesch and SMOG indexes, the directions were measured at the college readability level; using the Dale-Chall and FOG indexes, the directions were measured at the college graduate readability level.

In another study of the readability of the task statements and instructions in Marine Corps task inventories (Kishi, 1976), instructions were considerably more readable than the task statements (9-10 grade level for instructions vs. college graduate level for task statements) using the Dale-Chall formula. Since the instructions did not contain a large number of technical words, fewer words were rated as "unfamiliar," thus reducing the difficulty level. However, the FOG and SMOG indexes reflected somewhat greater difficulty levels for instructions. Evidently the increased sentence length in instructions outweighed any reduction in the number of words with many syllables. Because of the many inconsistencies, differences, and built-in limitations of the various readability indexes, it is hazardous to draw precise conclusions about the readability of task inventories. The author of the readability study report of Marine Corps task inventories cautioned against relying too heavily on the measurements obtained from applying readability indexes since each formula is really applicable only to the types of written material on which it was based.

Duffy and Kabance (in press) take an even stronger position with regard to the usefulness of readability formulas in their conclusions from a study testing the readable writing approach to text revision. In a series of five experiments, their results indicated that readable writing revisions can facilitate comprehension under very particular circumstances. However, the resulting changes in the readability score are not, in any way, predictive of the changes in comprehension. Thus, these authors concluded that a readability formula score is neither a good guideline nor a good criterion for producing comprehensible text. In the absence of more specific and substantial guidance on how to construct a comprehensible task inventory, the inventory developer will have to rely on the general guidelines presented here, good judgment, and common sense.

<u>Blocking</u>. The grouping of task statements and other inventory items into blocks can be a useful technique for organizing the contents of a task inventory if the blocking is done appropriately and the labeling of the blocks is accurate and comprehensive. Blocking, when it is used, typically is based on duty categories. Duty categories are functional areas of a job used to group related tasks. Block labels help the inventory respondent skip quickly over blocks of items that do not apply to his or her work in the rating or specialty. The respondent can answer a blocked inventory more quickly and probably provides more carefully considered responses than those to a lengthy unblocked inventory containing many tasks that the respondent does not perform. When blocking is used, a job incumbent should be able to respond to a maximum number of items in the amount of time allotted for administration of the survey. This may mean that the content of the inventory can be prepared at a greater level of detail and specificity. In addition to guiding a respondent through an inventory booklet, duty titles or block labels aid the occupational analyst in identifying job groups or clusters.

However, choosing a title or label for a duty category or block is critical. If the title/label does not accurately and completely reflect the items in the block, the respondent may skip over the block when in fact he or she may perform some of the tasks. For this reason, the U.S. Navy and Marine Corps deliberately do not include duty headings in their task inventories so that a respondent is not tempted to skip a section. However, task statements in NODAC and USMC inventories are grouped into blocks under implicit duty headings, with the rationale for this blocking being known to the NODAC and USMC task analyst.

NODAC has experimented with blocked task inventories in which the blocks were implicit or made explicit by appropriate labeling. NODAC has also experimented with an inventory format in which the items in each section were presented in a random order. Although this experimentation was not conducted in a research mode addressed to comparing which format yields better respondent data or most facilitates the subsequent analysis of respondent data, some tentative conclusions can be drawn. Duty categories provide a meaningful way to organize task statements so that both the inventory respondent and occupational survey analyst have a structured and logical way to look at jobs and the duties inherent in these jobs. Other conclusions can be drawn from U.S. Air Force experience.

The organization of U.S. Air Force job inventories relies heavily on the blocking feature, whether the block can be skipped or not. Common tasks which everyone in a particular Air Force specialty performs are placed at the beginning of the inventory. How the remaining tasks are grouped into blocks depends on the nature of the specialty and is left up to the judgment of the USAF inventory developer. The USAF Occupational Measurement Center has opted for this inventory format because inventory developers are convinced it expedites responding to a job inventory in an allotted amount of time and because it facilitates analysis of the output from CODAP.

<u>Sequence of Inventory Items in a Block or Section</u>. Several methods for sequencing inventory items in blocks or sections have been used by inventory developers, and each method has certain advantages and disadvantages. Task statements should be arranged in some orderly and rational sequence such as by duty categories, by an alphabetical listing of all tasks, or by randomization: ·Arranging task statements by duty categories brings together similar work activities in one block. An alphabetical listing of task statements under each duty category heading tends to group together tasks in which the action verbs are similar. A randomized arrangement may force respondents to read and consider each item, rather than skipping over groups of items and failing to consider ones that they actually perform. Randomness may also make the inventory artificially difficult, however, because of the constant change in context or frame of reference required for each item.

Arranging task statements alphabetically within duty areas is the form of organization used by the USAF Occupational Measurement Center in preparing its job inventories. In NODAC task inventories, task statements are grouped in a logical sequence under standard duty category headings, although the duty categories are not identified in the inventories by either a heading or by spatial separation between groups of tasks. The preference of task inventory developers in Prince George's County, Maryland (Gambardella & Alvord, 1979, p. 26) and the U.S. Marine Corps has been to list tasks without regard to alphabetical order but in an order which either presents a logical sequence of activities or just makes good sense to both the respondent and the job analyst.

Respondent considerations in choosing a sequencing method include ease of inventory response, a tendency to skip over items, response bias, and a possible order effect (e.g., initial items may be responded to more frequently or judged to have a greater relative time spent than later ones). Research is needed in this area to determine possible respondent effects. In the absence of more specific evidence concerning how different sequencing methods might affect the quality and comprehensiveness of inventory responses, the inventory developer will have to choose an order that makes good sense and that is logical for the nature of the occupation being surveyed.

<u>Rating Scales Used in Task Inventories</u>. If the job incumbent responding to a task inventory is instructed to indicate only whether or not each task in the list is performed, the inventory takes the form of a simple check list. However, usually additional information is asked about each task, generally referred to as primary and secondary task rating factors. Primary task rating factors allow the respondent to indicate or rate the relevance of each task performed to the job, for example, in terms of importance, frequency of performance, or amount of time spent performing the task. A relative time spent scale usually is used in preference to a scale based on absolute time spent or percentage of time spent because job incumbents have great difficulty breaking up total time spent (100 percent) into individual percentage estimates for all tasks in an inventory. Secondary task rating factors typically elicit more subjective responses from the job incumbent about each task performed. Examples are criticality of task, difficulty of

learning task, extent of training required, training emphasis task should
receive, satisfaction in performing task, and level of involvement in task
(e.g., assist, perform, perform and supervise, supervise, or instruct).
Secondary factors are useful to curriculum developers because response data
pertaining to these factors make it possible to identify training require-
ments by job levels.

The U.S. Air Force collects its task data by having job incumbents first
check all tasks they perform now. All tasks checked then are rated on a
nine-point Relative Time Spent in Present Job scale as follows.

1. Very small amount.
2. Much below average.
3. Below average.
4. Slightly below average.
5. About average.
6. Slightly above average.
7. Above average.
8. Much above average.
9. Very large amount.

The U.S. Navy collects its task data by having job incumbents indicate
the relevance of each task in the inventory booklet to their particular job
by also responding to a Relative Time Spent scale, with points ranging from
"Very much" (a score of 7) to "Very little" (a score of 1). The Relative
Time Spent scale responses are changed into proportionalized Relative Time
Spent responses for each respondent by converting the Relative Time Spent
responses to percentages that sum to 100 percent for all tasks performed by
an individual. In addition, for each task statement, a Percent Performing
score is calculated by scoring each respondent 1 if he or she performs the
task at any level (1 to 7) and 0 if he or she does not perform the task at
all. Scores across all respondents then are summed, and a total Percent
Performing is calculated. The new CODAP System 80 is able to accommodate any
rating scale, not just relative time spent.

In a research study of methods to evaluate rating scales for stable task
inventory information, Pass and Robertson (1980) concluded that the dichoto-
mous Task Performed scale yields stable, meaningful task information from job
incumbent responses. No practical gain in information was achieved from the
more complex Relative Time Spent scale. These researchers felt that more
informative, more efficiently collected estimates of the time spent per task
probably could be based on job incumbents' ranking of a small number of the
most time-consuming tasks.

In addition to collecting Relative Time Spent data, NODAC task inven-
tories also collect data pertaining to the capacity in which the job in-
cumbent performs the task. The respondent is instructed to indicate his or
her involvement in the task (a secondary factor) by marking one of three
choices: (1) I assist (helper relationship), (2) I do, or (3) I supervise.

NODAC currently is considering omitting the secondary factor task involvement rating scale from future inventories because no consumers of NODAC data appear to be using the data collected by this scale. A further argument for not collecting these data is that involvement in the task as traditionally rated does not constitute a psychometric scale. The verb "Assist" is vague and ambiguous. Assisting someone in the performance of some task usually can be expressed as another task (e.g., "Record fuel tank soundings made by supervisor" or "Hand tools up to co-worker overhauling engine of helicopter"). The verb "Supervise" is also ambiguous as it is used in the task involvement rating scale because the task itself is not what is supervised, rather the worker performing the task. For these reasons, the Air Force does not use the secondary factor scale "I assist, I do, I supervise."

Survey Sample Size. When a job task inventory questionnaire is administered for a particular rating, not all job incumbents occupying billets of that rating are sampled, unless the rating is small. In the early days of NOTAP, the job task inventory sample size typically amounted to over 60 percent of all personnel in a rating. In order to reduce the survey burden on the operating forces, sample size has been reduced to 18-23 percent, and recent research has indicated that the sample size can be reduced even further, in some cases, without compromising the validity of survey results. In a research study of methods to evaluate survey sample size for stable task inventory information, Pass and Robertson (1980) concluded that highly stable rating scale data and cluster solutions are obtainable from samples substantially smaller than those previously administered. This study's empirically developed relationship between sample size and stability can be usefully employed to determine cost-effective sampling for task inventory surveys. For example, for the large occupational populations of Navy ratings alone, use of these aids may reduce the time demands on the fleet by approximately 52,000 work-hours per cycle of inventory administration.

If an Army Military Occupational Specialty (MOS) has less than 1000 individuals in it, the complete census of the MOS is surveyed. Otherwise, a representative sample is administered the survey. If there are 3000 or fewer individuals in an enlisted Air Force specialty, the job inventory is administered to everyone in the specialty. Otherwise, a representative sample of the members of the specialty is surveyed. The Air Force is not able to take advantage of the cost benefits of smaller samples because with a small sample they would be unable to develop specialty-oriented training standards needed by the Air Force training community or know about all job variations in the heterogeneous specialties. In addition, Air Force occupational analysts believe that large sample sizes promote user confidence in the data obtained.

Methods for Administering Task Inventories. Team administration of job task inventory questionnaires has always been the preferred NOTAP data collection method because it produces a greater return of useful and accurate data. Consequently, this method is employed whenever possible, supplemented

by a mail survey of job incumbents who are deployed or at locations not covered by survey teams to increase the representativeness of the survey sample. Contact and interference with the fleet are kept to a minimum. However, since the job incumbent is the primary source of information, it is necessary to go directly to the worker at the job site.

When a mail survey procedure has to be used exclusively, fewer returns can be expected and the representativeness of the sample may be compromised. If no one is available to answer the job incumbent's questions regarding the survey booklet, directions for responding may be misinterpreted and may lead to the return of inaccurate data which are difficult to identify. As a result of these potential problems, the Navy and Marine Corps team administer their job and task inventories, although both the Army and Coast Guard have successfully employed a mail survey procedure. Diligent follow-up to maximize the percentage of returns is the key to a comprehensive survey. The Air Force administers its surveys through consolidated base offices by mailing job inventories to the occupational survey control officer at each base who then is responsible for administration.

Methods for Transcribing Task Inventory Responses to Machine-Readable Format. Various technologies are available for transcribing task inventory responses to machine-readable format. Optical scanning, usually of the mark sense variety, has been employed in the past primarily by organizations with a large number of job incumbents to be surveyed on a relatively regular basis. The high cost, compared to standard printing, of printing the special forms required for scanning has almost guaranteed that only those organizations large enough to benefit from economy of scale would employ this methodology. The speed and reliability of scanning equipment has increased significantly over the past several years, so that once the response forms are properly marked and coded, the task inventory data can be converted to machine-readable format at speeds unmatched by conventional keyed data entry. Problems encountered with the use of scanning are incompletely marked or erased responses and responses marked in a medium unreadable by the scanning equipment (e.g., a blue ballpoint pen).

Scanning has been the method of choice by military users of CODAP. When scanning is chosen, response forms must be formatted and printed to strict specifications within the capabilities of the scanning equipment to be used. Caution must be taken to design a form that is readable both by the scanning equipment and by the job incumbent who will be entering responses on the form. The U.S. Air Force uses a job inventory booklet designed and printed by MRC, Iowa City, IA. In this booklet, a set of nine scannable response columns is printed alongside of the items on each page of the inventory to make it easier to respond. The respondent does not have to mark his or her responses on a packet of scannable response sheets separate from the inventory booklet itself. Use of the MRC booklets has decreased the error rate experienced by the USAF Occupational Measurement Center since there is less likelihood that the inventory respondent will mark responses in the wrong place. However, the MRC booklets are more expensive than using a separate packet of scannable response sheets.

NODAC currently is using NCS equipment to scan a separate packet of response sheets. In order to take advantage of the cost savings attainable by printing response sheets in bulk, NODAC currently has a one to two year supply on hand. However, when this supply is exhausted and the present lease agreement for the NCS equipment runs out, NODAC will have the option of changing over to the MRC inventory booklet format in which response columns are integrated. Most military users of CODAP are constrained in their choice of a method for transcribing task inventory responses to machine-readable format by the equipment resources available within their own organization in order to minimize costs.

HANDBOOK FOR CONSTRUCTION OF TASK INVENTORIES

FOR NAVY ENLISTED RATINGS

CHAPTER 3
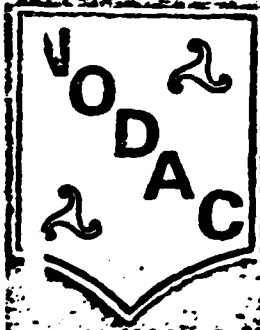
USES OF NOTAP TASK INVENTORY DATA

The data produced by the Navy Occupational Task Analysis Program (NOTAP) of NODAC historically have been used in a myriad of ways by a multitude of consumers. Historical uses of NOTAP data are described in Callahan and Rosenthal (1977) and in Navy Occupational Analysis in the 1970's (1977). Table 3-1 summarizes past and present uses of NOTAP task inventory data. Definitions for abbreviations and acronyms used in Table 3-1 to identify NOTAP users are provided below and in Appendix B.

NOTAP data are used by the Naval Military Personnel Command (NMPC) in support of its recruitment, selection, and assignment functions. Job satisfaction data collected by NOTAP surveys are used in making policy decisions to improve retention. NMPC also uses NOTAP data to prepare descriptions of Navy enlisted ratings and officer specialties. In addition, the Rating Review Board (RRB) of NMPC uses NOTAP data and special studies as primary resources in rating structure and classification systems management (1) for NEC (Navy Enlisted Classification) validation, and (2) for making decisions to modify, combine, establish, or disestablish Navy ratings, service ratings, and NECs. A standing requirement exists for NOTAP data concerned with current and projected RRB agenda items to serve as validation for proposed changes to the existing rating structure.

NOTAP data provide the primary source of information for revision of enlisted occupational standards. One of the major users of NOTAP data is the Occupational Standards Division (Code 31) of NODAC. In turn, revised enlisted occupational standards are used by many Navy consumers for a variety of purposes as itemized below.

- The Instructional Program Development (IPD) Centers of the Naval Education and Training Command (CNET) use enlisted occupational standards for developing personnel advancement requirements (PARs) and advancement in rate examinations, rate training manuals, and nonresident correspondence courses.

- The Naval Technical Training Command (CNTT) uses enlisted occupational standards and NOTAP task inventory data to develop "A" and "C7" school curriculums.

- The Naval Military Personnel Command (NMPC) uses enlisted occupational standards for enlisted distribution and detailing.

- The Chief of Naval Operations (CNO) uses enlisted occupational standards for rating/rate management (OP-132).

- The Naval Sea Systems Command (NAVSEASYSCOM) has used enlisted occupational standards for developing the Maintenance Requirement Cards (MRCs) used in the Planned Maintenance System (PMS).

- The Naval Air Systems Command (NAVAIRSYSCOM) has used enlisted occupational standards for developing the Naval Aircraft Maintenance Program (NAMP) of the Planned Maintenance System (PMS).

Table 3-1

Uses of NOTAP Task Inventory Data
Identified by Users

USES (PURPOSE)

USERS

1. Description of Navy enlisted
   ratings and officer specialties

1. NMPC

2. Rating structure and classifica-
   tion systems management (NEC
   validation; modifying, combining,
   establishing, or disestablishing
   Navy ratings, service ratings,
   and NECs)

2. NMPC

3. Information on job satisfaction
   levels of naval personnel

3. NMPC

4. Revision of occupational
   standards - USED FOR:

4. NODAC Occupational Standards
   Division (Code 31)

   a. Development of personnel
      advancement requirements and
      advancement in rate exams

   a. CNET - NAVEDTRAPRODEVCEN

   b. Development of rate training
      manuals

   b. CNET - NAVEDTRAPRODEVCEN

   c. Development of nonresident
      correspondence courses

   c. CNET - NAVEDTRAPRODEVCEN

   d. Development of "A" school
      curriculums

   d. CNTT

   e. Development of "C7" school
      curriculums

   e. CNTT

   f. Development of MRC (PMS)

   f. NAVSEASYSCOM

   g. Development of NAMP (PMS)

   g. NAVAIRSYSCOM

   h. Enlisted distribution and
      detailing

   h. NMPC

   i. Rating review board delib-
      erations

   i. CNO

(Continued)

Table 3-1   (Cont.)

Uses of NOTAP Task Inventory Data
Identified by Users

USES (PURPOSE)	USERS
5. Training (NOTAP surveys)	5. CNET, CNETS, CNTT, and service schools
6. Training (training importance surveys)	6. CNET
7. Management and manning studies; manning requirements and determinations	7. NAVMMACLANT, NAVMMACPAC
8. Personnel research (data support)	8. NPRDC, ONR, BUMED, and Navy contractors
9. Special one-time studies	9. Numerous and varied
10. Resource support to joint interservice efforts	10. DoD Executive Agent for Joint Task Analysis Support, Joint Interservice Training Committee
11. Technical support and consultation to other task analysis programs in the civilian and military sectors (in the United States and abroad)	11. National Security Agency; Civil Service Commission; Office of Civilian Manpower (Personnel) Management; British Royal Navy; Immigration and Naturalization Service; U.S. Park Police; Prince George's County, Maryland

The Navy training community is another major user of NOTAP data. For every Navy rating in its databank, NOTAP provides the training community with an initial package of standard CODAP computer printouts including a wide range of background data, equipment usage, task performance; and job clustering information. This initial package is often followed by a workshop in the use and interpretation of NOTAP data, and by additional computer printouts specially designed to assist in the training task analysis process. NOTAP staff personnel regularly participate in and conduct workshops for the staffs of the Chief of Naval Education and Training (CNET), the Chief of Naval Education and Training Support (CNETS), the Chief of Naval Technical Training (CNTT), and numerous service schools.

Recently NODAC has begun a new program of conducting training importance surveys to support CNET in instructional curriculum design. The contents of training importance surveys for enlisted ratings in the Navy are determined by CNET. However, the administration of these surveys and the computer analysis of the resulting respondent data are conducted by NODAC.

Navy Manpower and Material Analysis Control, Atlantic and Pacific (NAVMMACLANT and NAVMMACPAC) use NOTAP data in support of management and manning studies for establishing manning requirements and making manning determinations.

NODAC has supported personnel research in the Navy by providing NOTAP data to the Navy Personnel Research and Development Center (NPRDC), the Office of Naval Research (ONR), the Bureau of Medicine and Surgery (BUMED), and Navy contractors. Researchers at NPRDC have used NOTAP job satisfaction measures as predictors of retention for Navy enlisted personnel (Royle & Robertson, 1980), and NOTAP task data to develop methods for evaluating job task scales and survey sample size for stable task inventory information (Pass & Robertson, 1980). NODAC has provided job analysis information to the Office of Naval Research and has interfaced NOTAP data with Bureau of Medicine and Surgery information for a cooperative occupational analysis of the Hospital Corpsman (HM) rating. Magnetic tapes of NOTAP inventory response data have been provided to a Navy contractor for a study of taxonomic approaches to enlisted occupational classification (Ramsey-Klee, 1979).

Numerous and varied special studies have been conducted by NODAC using NOTAP data. Typically these applications are one-time studies conducted at the request of an internal Navy command. Examples of these applications are the following: (1) a study for the Office of the Secretary of the Navy of NOTAP job satisfaction and re-enlistment intent data as related to compensation and shortage of petty officers; (2) a commonality study for CNO of the Aviation Structural Mechanic (AM) rating to determine if the AMH (Hydraulic) and AMS (Structures) service ratings could be combined; (3) a study for CNO of NOTAP job satisfaction and re-enlistment intent data compared with data from the Navy's separation questionnaire; and (4) an occupational study for CNO of the Mess Management Specialist (MS) rating to compare NOTAP job satisfaction data to the ethnic origin of rating incumbents.

NOTAP data are a resource of the DoD Executive Agent for Joint Task Analysis Support and the Joint Interservice Training Committee for determining the feasibility of establishing common core training.

Aside from the uses already described, NOTAP data and expertise have been utilized in a broad variety of other ways. Analysts from NOTAP assisted the National Security Agency in setting up a similar program in that agency; the Civil Service Commission sought and received assistance in employing NOTAP methods and techniques to assist in validating the Professional and Administrative Career Examination (PACE) as a substitute for the Federal Service Entrance Examination (FSEE); NOTAP has processed civilian occupational task analysis data for the Office of Civilian Manpower Management; and the British Royal Navy patterned its task analysis program after NOTAP.

Technical support and consultation have also been provided to the Immigration and Naturalization Service in using CODAP to develop a training program and to defend their selection procedure against legal challenge; to the U.S. Park Police in using CODAP to construct a job information test employed in their promotion system and a performance rating form; and to Prince George's County, Maryland in developing TI-CODAP, a computerized method of job analysis for personnel management (Gambardella & Alvord, 1979).

New uses and requirements for NOTAP data come into being as a result of the increased use of occupational survey data by Navy manpower and personnel managers and the Navy research community. Requests for new studies are made via the Naval Military Personnel Command (NMPC-5) or by direct contact in writing to the Officer-In-Charge, NODAC.

HANDBOOK FOR CONSTRUCTION OF TASK INVENTORIES

FOR NAVY ENLISTED RATINGS

CHAPTER 4
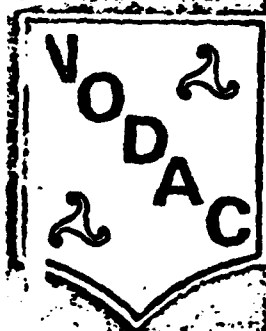
OVERVIEW OF TASK INVENTORY DEVELOPMENT

Scope

Task inventory development is the first stage of the occupational survey and analysis process. At NODAC, construction of a task inventory for a particular enlisted rating consists of three major phases as shown in Figure 4-1. In Phase I, research is conducted to locate and gather all resource materials useful to the task inventory developers. In Phase II, the task inventory development team visits selected Navy commands in order to observe and interview job incumbents in the rating to be surveyed. During these interviews, they identify all the duties and tasks that job incumbents actually perform, and the equipment or systems they operate or maintain. In Phase III, the task inventory developers return to NODAC to construct the task inventory booklet. They finalize the contents of the task inventory and submit it to several levels of review, both within and outside of NODAC. When the review is complete and all necessary revisions have been made to the task inventory, a final review copy of the inventory with all recommended changes attached is routed up the NODAC chain of command for comment and final approval. The approved task inventory booklet then is prepared on p 'nting guides, proofed, corrected, and sent to the printer. These three phases of task inventory developmen' are described in detail in Chapters 5, 6, and 7.

Phase I	Phase II	Phase III
Research and Work-Up of Information	Prepare for and Conduct Observations and Interviews (O&I)	Inventory Construction and Review
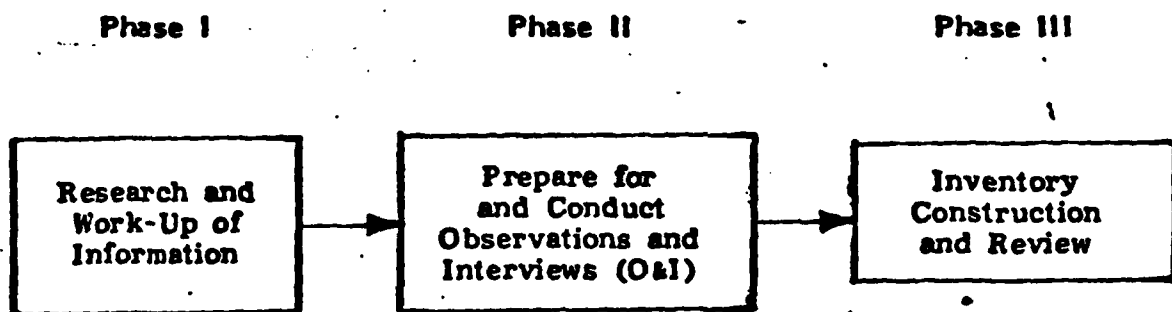
Figure 4-1. The Three Phases of NODAC Task Inventory Construction for a Particular Enlisted Rating.

Job task analysis aims at determining the nature of existing jobs in the Navy, the relationships among these jobs, and what individuals performing these jobs actually do at the job task level. When task inventory developers go out on observation and interview (O&I), they are NOT visiting selected commands to inspect the internal efficiency and effectiveness of individual operating units.

- They are NOT inspectors.

- They are NOT efficiency experts.

- They are NOT time and motion study technicians.

- They do NOT evaluate individual operating units.

- They do NOT audit standard operational procedures.

- They do NOT evaluate individual proficiency.

Failure on the part of job incumbents being interviewed during O&I to understand that NODAC task inventory developers are not visiting their command for any of the reasons listed above has been the source of some hostility and lack of cooperation in the past. "Clearing the air" on these points can have a favorable impact on the success of the O&I phase.

Time Frame for Task Inventory Development

The standard time frame for NODAC task inventory development is 35 weeks. The sequential development activities that take place during this 35-week period and the amount of time required to accomplish each activity are shown in Table 4-1. In Chapters 5, 6, and 7, these activities are described in detail.

Table 4-1

35-Week Time Frame for Task Inventory Development

Development Activity	Number of Weeks
Research and work-up of information (Phase 1)	6 (Weeks 1-6)
Prepare for O&I (Phase II)	6 (Weeks 7-12)
Conduct O&I (Phase II)	2 (Weeks 13-14)
Construction of task inventory booklet based on what was collected during O&I (Phase III)	3 (Weeks 15-17)
Review by NODAC Code 21 "Murder Board" (Phase III)	1 (Week 18)
Revision of task inventory booklet based on "Murder Board" review; preparation of cover letter for in/out of house review by NODAC's primary and technical advisers (Phase III)	1 (Week 19)
In/out of house review by primary and technical advisers (Phase III)	6 (Weeks 20-25)
Revision of task inventory booklet based on changes recommended by primary and technical advisers (Phase III)	2 (Weeks 26-27)
Final review by NODAC personnel (Phase III)	1 (Week 28)
Preparation of printing guides, final proof, corrections, and preparation of printing request (Phase III)	1 (Week 29)
Task inventory booklet submitted to Publications and Printing COMNAVMILPERSCOM (NO12) for printing (Phase III)	6 (Weeks 30-35)
TOTAL NUMBER OF WEEKS	35

HANDBOOK FOR CONSTRUCTION OF TASK INVENTORIES

FOR NAVY ENLISTED RATINGS

CHAPTER 5

RESEARCH AND WORK-UP

OF INFORMATION

(PHASE I)

. In the first phase of task inventory development, research is conducted
to locate and gather all resource materials useful to the task inventory
developers. Figure 5-1 shows a flowchart of the various steps performed in
Phase I. Each step is described in detail below.

Selection of Ratings To Be Surveyed

Selection of the ratings to be surveyed is made by the Commander, Naval
Military Personnel Command (NMPC) and the Chief of Naval Education and
Training (CNET), based on projected occupational development and review
requirements for the Navy. When NMPC/CNET issues a request for an occupa-
tional survey of an enlisted rating, the machinery of task inventory devel-
opment is set in motion.

Step 1 - Development of Inventory Booklet Assigned to Development Team

Responsibility for the development of the task inventory booklet is
assigned to a NODAC development team when the authorization to conduct an
occupational survey and analysis of an enlisted rating is received. Members
of the development team are assigned from NODAC's Data Collection Division,
depending on the size and location of the rating. In addition, one member
each from the Analysis and Occupational Standards Divisions is assigned to
the development team. The purpose of the early participation by these two
analysts is to provide for a continuous flow of information to the analysts
during the inventory development process.

Any individuals in the rating being surveyed who are currently on board
at NODAC are designated as subject matter experts (SMEs) and serve as ad-
visers to the project. However, they are excluded from participation until
after the development team returns from observation and interview (O&I). The
reason they are excluded is that they tend to be biased about the work of
their rating and may overlook tasks that they consider to be routine.
Instead, their expertise is drawn upon during the final construction of the
inventory booklet when they are asked to provide guidance on the proper
wording of task statements and other technical issues.

A senior enlisted member of the Data Collection Division is appointed as
the project manager of the task inventory development team. This individual
is responsible for coordinating the activities of team members and reports to
the Task Inventory Development (TID) supervisor. The TID supervisor reports
to the Director of the Data Collection Division on a weekly basis.
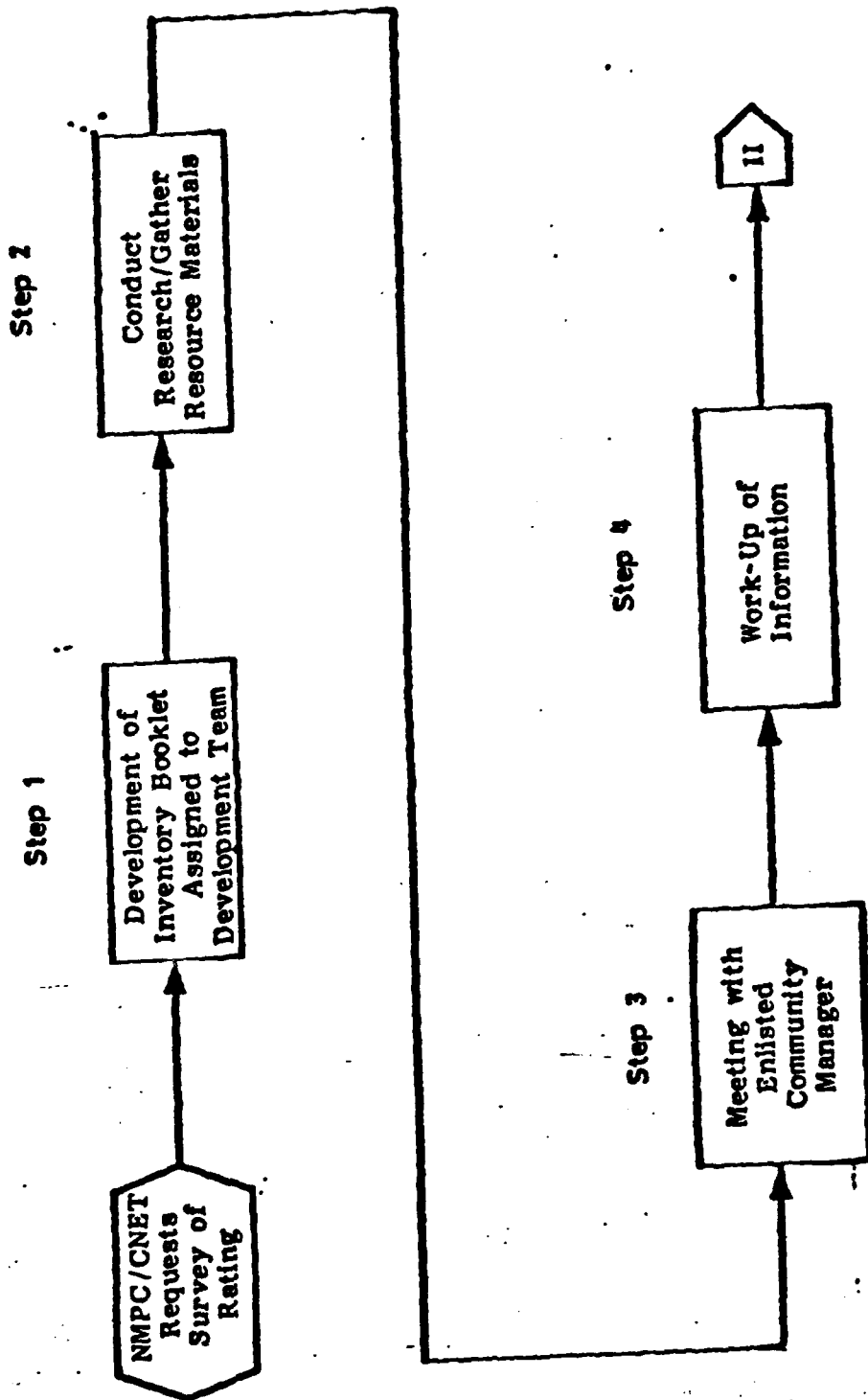
Figure 5-1. Flowchart of Phase I - Research and Work-Up of Information.

Step 1
Development of Inventory Booklet Assigned to Development Team

Step 2
Conduct Research/Gather Resource Materials

Step 3
Meeting with Enlisted Community Manager

Step 4
Work-Up of Information

NMPC/CNET Requests Survey of Rating

II

Step 2 - Conduct Research/Gather Resource Materials

In Step 2, research is conducted to locate and gather all resource materials useful to the task inventory development team. These materials are gathered from both outside and within NODAC sources.

Outside Sources. All rating-related information obtained from outside sources is listed in Table 5-1, along with instructions about how and where to locate the information. The first source, MAPMIS (Manpower And Personnel Management Information System), provides information about where incumbents in the rating are located geographically, broken down by service ratings and pay grades (see Figure 5-2). This information is needed to determine which job incumbents are working out of the rating, and which commands to visit during the observation and interview phase. The MAPMIS listing is obtained by filling out a Data Processing Services Request (NAVPERS 5230/34), a copy of which is shown in Figure 5-3.

The second source provides information from CNET about the "A" school curriculum for the enlisted rating being surveyed. What is requested specifically are the learning objectives for the curriculum. How the needs of the Navy training community are addressed by NODAC occupational surveys is discussed in Chapters 2 and 3 of this handbook.

A third source of information is the input requested from NODAC's primary and technical advisers, the Navy training community, and the Chief of Naval Operations (OP-13). A copy of the previous task inventory booklet for the rating is sent to the appropriate Navy warfare command (Submarine, Surface, or Air), the appropriate systems command (Sea, Air, or Supply), CNET (N-9), CNTT (016), CONAVEDTRAPRODEVCEN, and CNO (OP-13), along with a letter requesting any changes or additions desired by these advisers. These commands have a second opportunity later in Phase III to review the final draft of the updated task inventory booklet and to suggest further revisions.

A fourth potential source of useful information are the manuals prepared by manufacturers of equipment or systems being used in the rating, particularly manuals for newly introduced equipment or systems. The introduction of new equipment or systems into the work of a rating is a sign to the task inventory development team that old sources of information may be out of date. In this case, it may be desirable to telephone or write the manufacturer to request a copy of any available documentation for the equipment or system. The types of documentation that are likely to be available include engineering, maintenance, operating, and technical manuals.

NODAC Sources. All rating-related information obtained from NODAC sources is listed in Table 5-2, along with instructions about how and where to locate the information. Information about the work of the rating can be found in current occupational standards; the task titles listing; the previous task inventory booklet; the Job Dec for Rate; previous task inventory common coding; the previous NODAC Occupational Brief; and previous trip reports or correspondence relating to the rating. Additional sources are the rate training manuals, applicable course manuals, applicable personnel qualifications standards (PQS) manuals, all of which are available in the Code 21 Technical Library. A new source of information to be utilized is a training importance survey that may have been conducted for the rating.

Table 5-1

Rating-Related Information Obtained from Outside Sources

Information	How and Where To Locate It
Geographic location/NEC listing (NAPMIS 1221-4000 UR) of all incumbents in the rating.	Fill out Data Processing Services Request (NAVPERS 5230/34) located in the Code 21 Task Analysis Mail-Out Section (follow instructions located in file in Mail-Out Section). Be certain that all service ratings and pay grades are represented in the listing. Submit request form through mail-out clerk.
Class "A" school curriculum.	Telephone school to request a copy of the learning objectives for the curriculum. If the learning objectives are classified, a letter of request from NODAC Code 1 is necessary.
Initial input from NODAC's primary and technical advisers, the Navy training community, and the Chief of Naval Operations (OP-13).	Send a copy of the previous task inventory booklet for the rating to NODAC's primary and technical advisers, CNET (N-9), CNTT (O16), CONAVEDTRAPRODEVCEN, and CNO (OP-13), along with a letter requesting any changes or additions desired.
Manufacturers' engineering, maintenance, operating, and technical manuals for equipment and systems used in the rating, particularly newly introduced equipment or systems.	Telephone or write manufacturer to request a copy of any available documentation for the equipment or system. If the documentation is classified, NODAC Code 1 will have to make the necessary arrangements to obtain it.

5-3

Figure 5-2. A Partial Example of MAPMIS 1221-4000 UR for the Radioman (RM) Rating.

DATA PROCESSING SERVICES REQUEST
NAVPERS 5230/34 (REV. 7-79)
TO: DIRECTOR, TOTAL FORCE AUTOMATED SYSTEMS (NMPC-16)

(TO BE FILLED OUT IN TRIPLICATE)
ORIGINATOR'S REQUEST NUMBER

1. FROM (Requesting Office)	2. DATE OF REQUEST

3. REASON FOR REQUEST: ☐ NEW REPORT   ☐ REPORT MOD   ☐ CHANGE NO. COPIES   ☐ GENERAL REPORT MAINTENANCE

☐ RERUN REPORT   ☐ CHANGE DISTRIBUTION   ☐ SPECIAL REPORT   ☐ OTHER

4. SERVICES REQUESTED FROM _____ APPLICATION AREA/BRANCH (Add enclosure if necessary)

5. TYPE FORMAT DESIRED (Attach Sample)	6. NO. OF COPIES	7. DESIRED COMPLETION DATE
8. FREQUENCY OF REPORT	9. SECURITY CLASSIFICATION OF REPORT	

10. DISPOSITION OF SOURCE DATA

11. JUSTIFICATION OF REPORT (Include Purposes, Authority, Benefits and Cost Savings)

12. COULD REPORT BE CANCELLED IN EVENT OF MOBILIZATION?
☐ YES   ☐ NO

13. NAME OF PERSON ORIGINATING REQUEST	14. PHONE NO.	15. SIGNATURE (DIVISION DIRECTOR)

Figure 5-3.   Data Processing Services Request (NAVPERS 5230/34).

Table 5-2

Rating-Related Information Obtained from NODAC Sources

Information	How and Where To Locate It
Current Occupational Standards for rating.	Located in Data Collection Division (Code 21) Technical Library. Check with Occupational Standards Division (Code 31) to be certain they are <u>current</u>. Make two photocopies and return original to Code 21 Technical Library.
Task titles listing for previous survey of rating.	Located in Applications and ADP Division (Code 22). Make five reduced photocopies and return original to Code 22.
Previous task inventory booklet for rating.	Located in Code 21 master file or in Code 22. Make five photocopies of the following sections: job titles list, general quarters/watches/collateral duties list, equipment/tools/systems list, task statements list, and work locations list (not in all booklets). Return original to Code 21 or Code 22.
Job Dec for Rate for rating.	Located in Code 22. There are two books: (1) equipment and (2) task.
Previous task inventory common coding for rating.	Located in Code 31 files (on punched cards). Request a listing of card deck from Code 22. Make five reduced photocopies of listing. Return card deck to Code 31.

Table 5-2 (Cont.)

Rating-Related Information Obtained from NODAC Sources

Information	How and Where To Locate It
Previous NODAC Occupational Brief for rating.	Located in Code 21 Technical Library or Code 21 file of resource material for the rating. If a copy is not available in either place, request a copy from Analysis Division (Code 23). If there is only one copy available, make a photocopy and return the original copy.
Previous trip reports/correspondence relating to rating.	Located in Code 21 files of resource material for the rating. Review information.
Rate training manuals for rating.	Located in Code 21 Technical Library.
Applicable course manuals for rating.	Located in Code 21 Technical Library.
Applicable personnel qualification standards (PQS) manuals for rating.	Located in Code 21 Technical Library.

Development Plan. At this point it should be possible for the task inventory development team project manager to formulate a plan for developing the task inventory booklet. The development plan is a management tool that contributes to efficient use of resources when constructing a task inventory booklet. During the book building process, the development plan provides a ready reference to "where you are, where you are going, and where you have been." The plan should contain at least the following elements.

- Time Frame for Task Inventory Development (see Table 4-1).

- Work Assignments for Members of the Task Inventory Development Team.

- Planned Ways to Coordinate the Workload.

The task inventory development plan should be documented and filed in a project summary file. It is the first piece of documentation for an audit trail of the task inventory development process for the rating being surveyed. It is the responsibility of the project manager to initiate, add to, e d maintain the project summary file throughout the entire development process in order to ensure that complete information is available.

At the end of Phase III of task inventory development, a file is prepared in order to document which commands were selected for observation and interview, task inventory organization, additional survey background information, survey sample and expectations, and any problems encountered.

Step 3 - Meeting with Enlisted Community Manager

A meeting is held with the cognizant Enlisted Community Manager (ECM) for the rating being surveyed. The purpose of this meeting is to inform the ECM of NODAC's planned survey for updating the occupational data of an enlisted rating under that ECM's purview and to determine additional survey requirements. The NODAC task inventory development project manager attends this meeting with the two representatives to the team from the Analysis and Occupational Standards Divisions.

Step 4 - Work-Up of Information

In Step 4, the resource materials located and gathered in Step 2 are assembled and organized. Each category of information is described below.

Geographic Location/NEC Listing (MAPMIS 1221-4000 UR). A partial example of MAPMIS 1221-4000 UR is shown in Figure 5-2. This example also shows where the various categories of information can be found in the listing. Individuals identified in this listing to be working out of the rating are highlighted. These individuals are instructors, recruiters, rating incumbents in correctional facilities, or those working in special out-of-rating assignments, for example, individuals assigned to the Human Resource Management Detachment (HRMD) or the Counseling and Assistance Center (CAAC). These individuals are not performing the usual work of the rating, and they should not be part of the survey sample.

This listing also is used to determine the geographic areas and types of commands suitable to be visited by the NODAC O&I team. The following factors should be considered in making a final selection.

- The rating population available to be surveyed, by pay grade and by NEC.

- The sea/shore commands located in the geographic area.

- Cost to visit the geographic area.

Selection of commands within each geographic area is determined by the number of job incumbents available, broken down by command type, by NEC, and by system/job type. Command selection is tentative at this point. Final determination depends on later liaison with the commands under consideration.

Equipment and Task Lists from Previous Inventory. Determine the percentage of response to items in the equipment and task lists from the previous inventory. Two sources of information are used--the Job Dec for Rate and the previous task inventory booklet. Highlight items in the task inventory that received less than a 5% response on the previous survey as determined from the Job Dec for Rate.

Rate Training Manuals and Personnel Qualification Standards (PQS) Manuals. Rate training manuals and any available personnel qualification standards (PQS) manuals for the rating to be surveyed are located in the Code 21 Technical Library. Members of the task inventory development team are expected to read these manuals prior to O&I to familiarize themselves with the work of the rating.

When Step 4 is completed, Phase I - Research and Work-Up of Information is concluded. The task inventory development team then moves on to Phase II.- Prepare for and Conduct Observations and Interviews (O&I), which is described in detail in Chapter 6.

HANDBOOK FOR CONSTRUCTION OF TASK INVENTORIES

FOR NAVY ENLISTED RATINGS

CHAPTER 6

PREPARE FOR AND CONDUCT

OBSERVATIONS AND INTERVIEWS (O&I)

(PHASE II)

In the second phase of task inventory development, the task inventory development team visits selected Navy commands in order to observe and interview job incumbents in the rating to be surveyed. During these interviews, senior job incumbents review the previous task inventory booklet to determine whether its contents accurately reflect the duties and tasks that job incumbents actually perform, and they identify new tasks and equipment or systems that are not represented in the previous inventory. Figure 6-1 shows a flowchart of the various steps performed in Phase II. Each step is described in detail below.

Step 5 - Make Final Selection of Commands To Be Visited

The geographic areas and types of commands tentatively determined in Step 4 to be suitable and cost effective to visit by the NODAC O&I team are subjected to a final selection in Step 5. NODAC's tentative selection is influenced by the number of job incumbents available for observation and interview, broken down by command type, by NEC, and by system/job type. Liaison with the commands under consideration determines which of them actually are good candidates to be visited. Final considerations are any special activities going on in the command when the O&I team is scheduled to visit that would interfere with or rule out a successful O&I, and which ships will be available when the O&I team is scheduled to visit.

Historically, NODAC has conducted 12 observation and interview trips per year, roughly one per month on a staggered schedule of overlapping task inventory development for 12 ratings annually. However, with the ever increasing costs of travel, the command is considering a new policy of conducting O&I quarterly for several ratings at the same time. When the final selection of commands to be visited has been made, the task inventory development team moves on to Step 6 which is a two-part step.

Step 6A - Prepare Paper Work for O&I and Track It Through the System

This step is labeled Step 6A because it is performed at the same time that Step 6B is performed. Procedures for preparing the necessary paper work for the O&I trip are listed below.

- Draft trip origination message using the standard message format shown in Figure 6-2. The process should be started seven weeks prior to the scheduled O&I departure date.
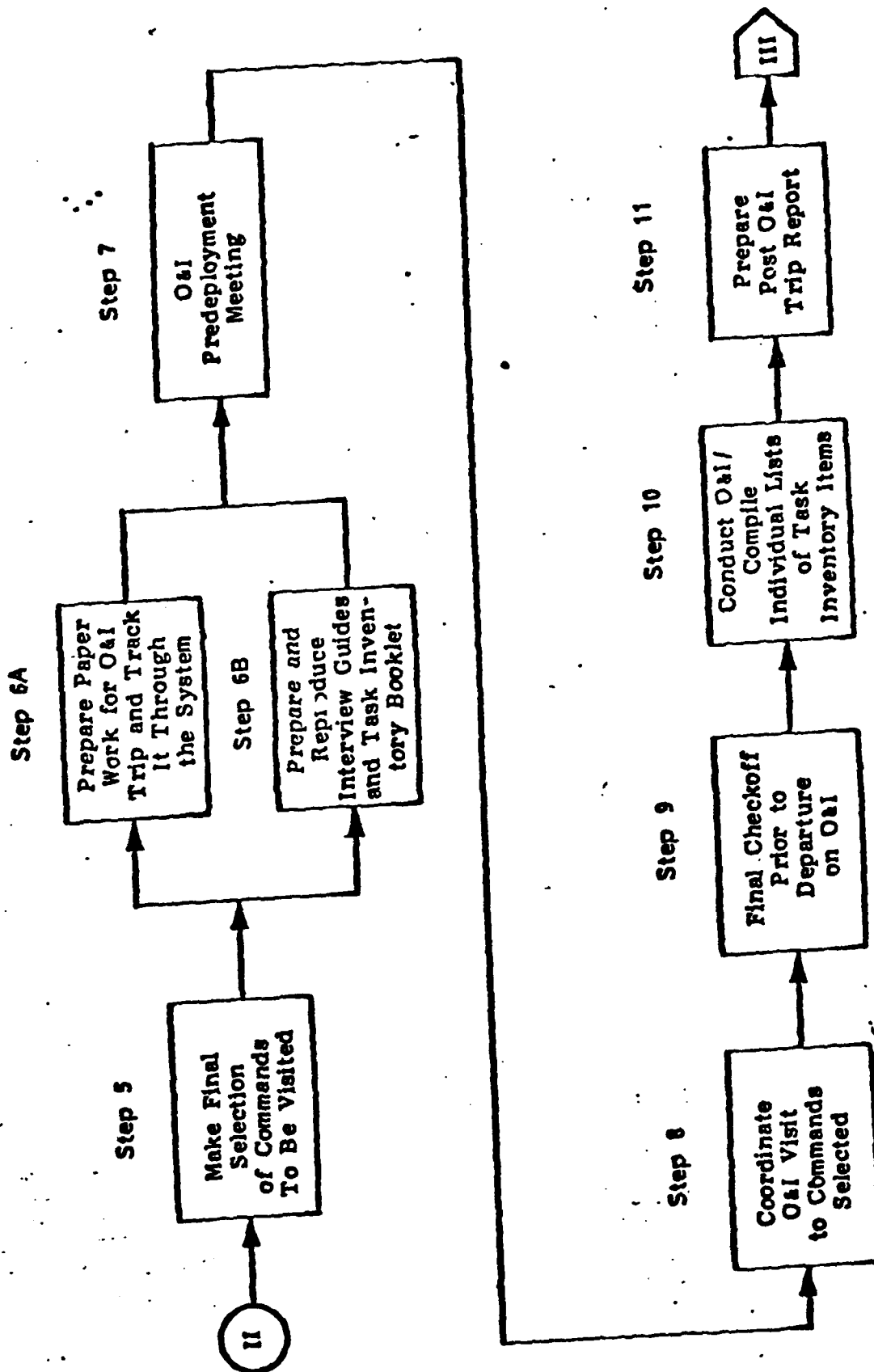
Figure 6-1. Flowchart of Phase II – Prepare for and Conduct Observations and Interviews (O&I).

Step 5

Make Final
Selection
of Commands
To Be Visited

Step 6A

Prepare Paper
Work for O&I
Trip and Track
It Through
the System

Step 6B

Prepare and
Reproduce
Interview Guides
and Task Inven-
tory Booklet

Step 7

O&I
Predeployment
Meeting

Step 8

Coordinate
O&I Visit
to Commands
Selected

Step 9

Final Checkoff
Prior to
Departure
on O&I

Step 10

Conduct O&I/
Compile
Individual Lists
of Task
Inventory Items

Step 11

Prepare
Post O&I
Trip Report

FROM: COMNAVMILPERSCOM WASHINGTON DC

TO: CINCLANTFLT NORFOLK VA

INFO: COMNAVSURFLANT NORFOLK VA

COMNAVAIRLANT NORFOLK VA

CNET PENSACOLA FL

_____
_____
_____
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_____

BT

UNCLAS //N03900//

SUBJ: NAVY OCCUPATIONAL TASK ANALYSIS PROGRAM (NOTAP) FOR _____ RATING (NMPC-5)

A. BUPERSMAN 1450100

B. FONECON BETWEEN _____ CINCLANTFLT AND _____ OF NODAC ON _____.

1. IAW REF A, THE NAVY OCCUPATIONAL DEVELOPMENT AND ANALYSIS CENTER (NODAC) WHICH IS A DETACHMENT OF COMNAVMILPERSCOM IS CONSTRUCTING AN OCCUPATIONAL TASK INVENTORY FOR THE _____ RATING. IN ORDER TO CONSTRUCT SUBJ INVENTORY IT IS NECESSARY TO INTERVIEW PERSONNEL IN THIS RATING IN PAYGRADES E-4 THROUGH E-9. INTERVIEWS ARE CONDUCTED IN WORKING ENVIRONMENT WITH MINIMUM DISRUPTION TO ACTIVITY ROUTINE AND NORMALLY TAKE ONE HOUR PER INDIVIDUAL. AS DISCUSSED IN REF B, NODAC REPS WILL VISIT ACTIVITIES IN

DURING THE PERIOD _____.

PAGE 1 OF 2

Figure 6-2. Standard Format for Drafting O&I
Trip Origination Message.

2. IN ORDER TO GET A GOOD CROSS SECTION OF THE _____ RATING AND TO
AID IN THE COLLECTION, PROCESSING AND ANALYSIS OF OCCUPATIONAL INFORMATION
ABOUT THE JOB CONTENT OF NAVY BILLETS, IT WILL BE NECESSARY TO VISIT THE
FOLLOWING COMMANDS:

        SHORE COMMANDS: _____

                              _____

                              _____

                              _____

                              _____

                              _____

                              _____

<u>SEA DUTY COMMANDS</u>

_____   _____

_____   _____

_____   _____

(EXAMPLE: NORFOLK   2 DDG; 2 SSN; 2 FF

            CHARLESTON   1 MSO; 1 AS; 1 AD; 2 DDG; 2 FFG)

3. REQ PROVIDE LIAISON OFFICERS AND COMMAND POINTS OF CONTACT (POC) FOR
SHORE/FLEET ACTIVITIES LISTED ABOVE TO ASSIST IN SCHEDULING. REQ DESIGNATED
LIAISON OFFICERS AND POC TELEPHONE NODAC PROJECT MANAGER _____
VIA AUTOVON 288-4631/32 OR COMMERCIAL 202-433-4631/32 NLT _____

4. NODAC TEAM MEMBER/CLEARANCE INFO IS:

RATE	NAME SSAN	DATE OF BIRTH PLACE OF BIRTH	CITIZENSHIP	LEVEL OF CLEARANCE

5. IT IS REQUESTED THAT THIS MSG BE READDRESSED TO ALL PARTICIPATING
ACTIVITIES AND THAT NODAC BE AN INFO ADDEE ON ALL MESSAGE TRAFFIC.
BT

<div align="center">PAGE 2 OF 2</div>

<div align="center">Figure 6-2. Standard Format for Drafting O&I
Trip Origination Message (Cont.).</div>

- Fill out Temporary Additional Duty (TAD) requests using the form shown in Figure 6-3. These requests should be filled out at the same time that the trip origination message is drafted.

- Submit draft trip origination message and TAD requests for Code 21 review. Paper work then is typed by Code 11 and submitted to Code 2 for review. When Code 1 approval is obtained, Code 11 delivers the approved paper work to NMPC-5.

- Monitor progress of paper work for O&I trip to ensure timely completion and return from NMPC-5.

- Deliver signed orders to Anacostia Disbursing (Travel Section), Building 92.

- Pick up orders, Travel Requests, and per diem checks from Anacostia Disbursing. Make certain that everything is <u>correct</u>.

Step 6B - Prepare and Reproduce Interview Guides and Task Inventory Booklet

At the same time that the procedures of Step 6A are being carried out, Step 6B is also performed. A list of the procedures followed in preparing and reproducing the various O&I interview guides and copies of the previous task inventory booklet are specified below.

- The Individual O&I Interview Guide is a standard form (see Figure 6-4). Reproduce sufficient copies of this form for use during O&I (usually 100 copies).

- The Physical Standards Interview Guide is a standard form (see Figure 6-5). Reproduce sufficient copies for use during O&I (usually 100 copies).

- Reproduce sufficient copies of the previous task inventory booklet (usually 5 copies).

Step 7 - O&I Predeployment Meeting

In Step 7, a meeting of the task inventory development team is held prior to their deployment on O&I in order to review the preliminary contents of the task inventory booklet to be certain that it meets the objectives of the survey and the information requirements of NODAC's consumers. All members of the development team attend this meeting, including the two representatives to the team from the Analysis and Occupational Standards Divisions. A standard meeting agenda is followed, and the team project manager assigns the material to be reviewed by each team member at the meeting. All resource materials used in the familiarization process are made available at this meeting.

TAD REQUEST

Name _____ Rank/Rate/Grade _____ Officer Desig _____ Date _____

SSAN _____ TAD for period _____ to _____

Reason for TAD: _____

_____

Command(s) reporting to: _____

If more than one command, provide dates at each one: _____

_____

Other places to be visited: _____

Government quarters available: ☐ Yes   ☐ No

    Date of confirmation: _____
    Name of contact: _____
    Telephone number: _____ ☐ AV   ☐ Commercial
    Control number for non-availability: _____

Government messing availiable: ☐ Yes   ☐ No If no, complete the following:

    Date of confirmation: _____
    Name of contact: _____
    Telephone number: _____ ☐ AV   ☐ Commercial
    Reason for non-availability: _____

☐ Request orders endorsement to read: "Utilization of government messing not required
such utilization would adversely affect the performance of TEMADD."

☐ Utilization of messing not required. (Officers and civilians only)

Mode of transportation:

☐ Travel via POV at ☐ $.16 a mile (military) ☐ $.20½ a mile (civilian).

☐ Travel via POV at ☐ $.16 a mile (military) ☐ $.20½ a mile (civilian) and use of
in/about TAD site at $.20½ a mile.

☐ Travel via POV as a passenger in _____ car.

☐ Travel via commercial air from _____ to _____
and return. Cost of T/R: $ _____.

☐ Travel via commercial air from _____ to _____
and return utilizing taxi service from/to residence. Cost of T/R: $ _____.

☐ Travel via government air.

☐ Rental car in/about TAD site. Rate: $ _____ per (day/week)
Company: _____ Confirmation number: _____

Figure 6-3 Standard NODAC Temporary Additional
Duty (TAD) Request Form

In addition:

☐ I desire leave in conjunction with TAD. Dates of leave: _____

☐ I desire advance travel allowance.

_____
                                            Signature

* *

Approved by:

Department Director: _____ Date _____

Administrative Officer: _____ Date _____

Officer in Charge: _____ Date _____

* *

FOR ADMIN USE ONLY

Per diem rate(s):   If POV used, distance to TAD site: _____ mi.

_____ – $ _____ a day   Security clearance: _____

_____ – $ _____ a day   Based: _____

_____ – $ _____ a day   Completed: _____ by _____

          Transportation via T/R $ _____
          Per diem   _____
          Miscellaneous Expenses   _____
          TOTAL ESTIMATED COST OF TAD $ _____
          Advance travel $ _____

                                  _____
                                  Financial Assistance P.O.   Da

                                  _____
                                  Assistant Admin Officer   D

          Figure 6-3   Standard NODAC Temporary Additional
                       Duty (TAD) REquest Form

DEPARTMENT OF THE NAVY
NAVY OCCUPATIONAL DEVELOPMENT AND ANALYSIS CENTER (NODAC)
BUILDING 150, WASHINGTON NAVY YARD (ANACOSTIA)
WASHINGTON, D.C. 20374

NAME _____ RATE _____ NEC'S _____ / _____

JOB TITLE _____ UNIT _____

AUTOVON PHONE NO. _____ WORK LOCATION _____

GQ STATIONS _____

WATCHES _____

COLLATERAL DUTIES _____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

Figure 6-8. Individual Observation and Interview Guide.

LIST THE 20 MOST PHYSICALLY STRENUOUS TASKS YOU PERFORM ON A REGULAR BASIS.

PHYSICALLY STRENUOUS TASKS   RANK ORDER

1.

2.

3.

4.

5.

6.

7.

8.

9.

10.

11.

12.

13.

14.

15.

16.

17.

18.

19.

20.

RANK THE 20 TASKS LISTED ABOVE IN THE ORDER OF MOST DIFFICULT (RANK OF 1) TO LEAST DIFFICULT (RANK OF 20) AND ENTER THE RANK ORDER IN THE COLUMN TO THE RIGHT.

Figure 6-5.   Interview Guide for Collecting Physical Standards
              Judgments During Observation and Interview.

The standard agenda for the O&I predeployment meeting is shown in Figure 6-6. The agenda covers six major topics for review and discussion. Specific points to be covered under each topic also are listed in Figure 6-6. A recorder should be appointed to document all changes from standard procedures adopted at this meeting, as well as any other significant items discussed. The documented agenda of the O&I predeployment meeting becomes a part of the audit trail of the task inventory development process, and is filed in the project summary file.

Any questions that may arise during the O&I predeployment meeting which cannot be resolved during the meeting are referred to a subject matter expert (SME) in the rating. An SME at NODAC or one in the Washington, DC area is telephoned or visited to resolve the questions.

Step 8 - Coordinate O&I Visit to Commands Selected

In Step 8, the task inventory development team project manager coordinates the O&I visit to the commands selected for observation and interview by performing the following procedures:

- Conduct final liaison with the commands to be visited.

- Assign specific responsibilities to O&I team members.

- Publish the trip schedule and itinerary for all members of the O&I team. The standard form used to prepare the trip schedule and itinerary is shown in Figure 6-7.

- Inform team members of uniform and other requirements.

Points of contact at each command to be visited are telephoned the week prior to departure to make certain that the team is expected and that the trip will go smoothly without any unexpected surprises.

Step 9 - Final Checkoff Prior to Departure on O&I

When the task inventory development team is ready to depart for O&I, each team member should have the following items in his or her possession.

- Orders, Travel Request, and per diem checks
- Team trip schedule and itinerary
- Previous task inventory booklet (1 copy)
- Individual Observation and Interview Guide (25 copies)
- Physical Standards Interview Guide (25 copies) -?
- Current Occupational Standards (1 copy)
- Note-taking paper and pencils, colored pencils or felt-tip pens for marking task inventory booklet (at least 5 colors)

1. BACKGROUND

    A. Why is rating being resurveyed at this time? Are there any
        special or nonroutine users?

    B. Any special considerations such as possible break-out or merger of
        NECs, new equipment, or rating incumbents occupying the billets
        of other ratings?

    C. Review user requirements.

2. O&I LOCATIONS AND SELECTION PROCESS

    A. How were commands selected for O&I determined?

    B. Why were these commands considered a good source of information?
        Why not other commands or more commands?

3. TASK INVENTORY ORGANIZATION

    A. Background Information. What categories of information are in-
        cluded in the Background Section--for example, Command Status, Job
        Titles, Work Locations? If other information is being collected
        in this section, describe it and explain why. The requirement may
        have come from the Occupational Standards Division (Code 31).

    B. General Quarters, Watches, and Collateral Duties. Explain any
        exceptions to the standard list for the rating or any changes from
        the previous task inventory.

    C. Equipment/Tools/Systems. Specify any changes to the equipment/
        tools/systems list in the previous inventory and why.

    D. Task Statements. Specify any changes to the task list in the
        previous inventory and why.

    E. Job Satisfaction and Job Importance. Explain any exceptions to
        the standard list or any changes from the previous task inventory.

    F. Physical Standards. Review the Physical Standards Interview
        Guide (see Figure 6-5).

    G. Miscellaneous Data. Specify what miscellaneous data are being
        collected and why.

(Continued)

Figure 6-6. Agenda for O&I Predeployment Meeting.

(Continued)

4. ADDITIONAL SURVEY BACKGROUND INFORMATION

   A. Specify any additional information useful in explaining types of equipment, newness of equipment, possible overlap of jobs, a shortage of job incumbents in the rating, and so on.

   B. Specify any special locations of equipment (for example, System XYZ is only found on Class DD 963 ships--SPRUANCE Class Destroyers).

   C. Specify any changes in the work of the rating that are anticipated (for example, a new service rating is under consideration).

   D. Specify any problems existing in the fleet concerning the rating (for example, E4s reporting on board cannot adequately perform the work of their rate).

   E. Specify date of current occupational standards for the rating. Are there any special questions about the work of the rating that the Occupational Standards Division wants answered?

   F. Is a training importance survey being planned or developed for the rating? If so, when is it expected to be administered? If a training importance survey has already been conducted for the rating, indicate the date of administration.

5. O&I REQUIREMENTS

   A. Specify planned observation and interview procedures.

   B. Are there any security problems associated with conducting O&I for the rating? What changes in O&I procedures can be made to avoid these problems?

6. TIME FRAME FOR TASK INVENTORY DEVELOPMENT

   A. Is the development of the task inventory proceeding on schedule? Explain any deviations from the time schedule and why.

   B. Are there any problems with meeting the remainder of the time schedule? If so, explain what they are. : ⌐, ⌐... •

Figure 6-6. Agenda for O&I Predeployment Meeting (Cont.).

RATE _____ TEAM MEMBERS _____

DATE/TIME	LOCATION	UNIT / # RATEES	LIAISON	TELEPHONE NUMBER

Figure 6-7.   O&I Trip Schedule and Itinerary Form.   Page 6-13

Step 10 - Conduct O&I/Compile Individual Lists of Task Inventory Items

Establishing Contacts. The first morning of an O&I trip is spent verifying schedules with activities to be visited and making any necessary changes. Normally two-person teams will visit commands to conduct interviews. This reduces the time required at any one command, and ensures that the information is gathered from more than one point of view. It also permits one person to interview a supervisor while another talks with a subordinate or builds a list of all equipment, tools, or systems that are operated, used, or repaired by people in that rating at that command. Both interviewers should <u>not</u> interview the same person, in a two-on-one situation.

Identifying and Selecting People to Interview. The first points of contact at a command will probably be the job supervisors. Generally they should be interviewed before talking with their workers. This helps establish the team's sincerity and credibility, and provides a better picture of the overall rating. Job supervisors have information about the job that may not be available to job holders, including items such as the order in which tasks are performed, infrequently performed but critical tasks, and clues as to which job holders may be most qualified to describe certain aspects of a job. Most supervisors leave the detailed description of work activities to their workers.

Workers usually provide factual information about their individual jobs but only limited data about a total system. Because interviewing all the workers is seldom desirable or possible, key personnel or workers with job experience in different shops or duties should be identified so that all are covered. In addition, minimum qualifications for interviewees should be specified. No interviewee should be included who has less than one month in his or her present job, and those with more experience should be selected, whenever possible.

Interviewing two or more people together, especially supervisors and subordinates, is usually not advisable, because, in those circumstances, people are more likely to say what they are supposed to do, rather than what they actually do. Group interviews are useful, however, in getting information from a number of people quickly. Group interviews could be used during O&I, near the end of a trip, to identify tasks that are done infrequently.

Selecting a Site. Interviews should be conducted in the work setting whenever possible. This puts the interviewee at ease, provides many cues to the interviewer, and helps the interviewee explain more easily all the tasks that he or she does. Unfortunately, Navy ships and shore stations are often noisy, crowded, hot, and full of interruptions. Because of this, sometimes interviews must be held outside the working area. In this case, a tour of the work spaces is especially important. As much time as possible should be spent at the actual work site.

<u>Conducting Job Analysis Interviews</u>. Techniques for conducting job analysis interviews are similar to those for conducting other types of interviews, although the content of the job analysis interviews may be different. Appendix E contains specific instructions and training materials on how to conduct job analysis interviews.

Although flexibility in tailoring the interview to the specific situation is important, using a standard order for structuring the interview helps ensure complete coverage. One useful order is by major duties. After asking for job title--an easy introductory question, the interviewer should ask about the duties performed. For each duty, all the tasks that are performed should be recorded. All the equipments used should be identified, along with the persons who do preventive maintenance and repairs on them. In addition, the interviewer should probe for additional tasks by asking who does the tasks before and after each task identified. The interviewer should examine reports and documents such as Watch, Quarter, and Station Bills, PMS Schedules/MRCs, PQS Schedules and Booklets, Division/Work Center Organization Charts or Procedures Manuals and obtain copies, if possible, of those that appear useful. In all cases, the interviewer should ask for clarification where necessary and follow up on unfamiliar terms, or new or unusual equipment.

When all the duties in the job have been covered, the interviewer should ask about tasks performed in collateral duties, watches, training activities, or emergency drill procedures.

For some jobs, a different order may be more appropriate, such as by duty station or work location, by system or equipment, or by time of the day or day of the week. Background information about the particular rating will be useful in selecting an appropriate order.

The team member who is compiling equipment lists should ask some interviewees, particularly supervisors, to review preliminary lists of the inventory contents, developed from previous inventories, and indicate tasks that are no longer current, equipment no longer used, or items that are incorrect or misleading. If each interviewee is given a different color pencil or felt-tip pen to use, responses from several people can be combined on one list, producing a summary record as these responses are gathered. While the equipment list is being reviewed, the interviewer can use the list of action verbs to probe for additional tasks for each equipment or system.

At some time near the end of the interview, the interviewer should ask each person to identify the most physically demanding tasks that he or she is required to perform. The majority of these tasks should be rating-related, although physically demanding tasks that are part of general shipboard duties may also be included, especially for ratings with few physical demands. For each task, the interviewer should determine as precisely as possible the specific task performed or object moved, the force required or weight of the object, and the number of people usually teamed together to do the task, as well as any special circumstances that make the task difficult. Examples of physically demanding tasks include the following:

- As one of a 3-person team, remove the SSTG pump (about 500 lb) from its mounting in the main propulsion space, and move it via catwalks to a vertical escape trunk (for further movement to the shop). (Electrician's Mate)

- As one of a 2-person team, drag 150 feet of aircraft fueling hose out of stowage on flight deck. (Aviation Boatswain's Mate Fuels)

- On completion of firing, hand-carry 5-inch round (74 lb) from gun mount back to magazine. (Gunner's Mate Guns)

- During a fire or flooding (emergency or drill), as one of a 2-person team, rapidly carry P250 pump (147 lb) to the scene. (General Shipboard)

The following guidelines should be used in documenting these tasks:

- Be as specific as possible about the equipment or component used. Model numbers or exact names are useful in determining weight or force required. For example, changing tires will vary greatly in physical demands depending on the particular tire.

- If power equipment or chain hoists are used, do not classify the task as physically demanding unless manual procedures are used for back-up, or physical strength is required to position the moving equipment or the object to be moved.

- Do not include general custodial chores such as moving furniture.

- Do not include working party tasks in which the demand could be reduced by carrying fewer objects at one time, or filling containers less completely. Include such tasks if the smallest reasonable load is physically demanding in itself, such as 5-inch rounds of ammunition, each weighing 74 pounds.

Descriptive information for each task should be recorded on the Physical Standards Interview Guide (Figure 6-7). The Guide has space for 20 tasks, although most interviewees will be able to provide only 5 to 10 tasks. When all the tasks have been described and recorded, the interviewee should be asked to rank them from most to least physically demanding and the ranks should be added to the Interview Guide in the column provided.

At the end of the interview, the O&I Check List (see Figure 6-8) should be used to ensure that all areas of interest are covered. Interviewers should keep it on their clipboards or in their notebooks and review it from time to time during the interview to prompt themselves to ask additional questions. They also should review it as they conclude the interviews to make certain everything has been covered. Any items of special interest for the particular rating should be added to the check list at the start of O&I.

Differences in Procedures Over the Course of O&I. An O&I trip consists of three general phases—an orientation to the rating, intensive data

O&I Check List

Have you covered?

_____ **Job Titles**

_____ **Watches**

    _____ Inport

    _____ Underway

_____ **Collateral Duties**

_____ **Primary Duties**

    _____ All categories of Occupational Standards

    _____ Walk-through of spaces and shops

    _____ Walk-through of regular processes or procedures
(steps, output, tools used)

_____ **Equipment**

    _____ Who uses it?

    _____ Who does PMS?

    _____ Who repairs (to 0 level, IMA level, and Depot level)?

    _____ Who does Quality Assurance?

_____ **Tools and Supplies**

    _____ Who orders?

    _____ Who issues?

_____ Safety procedures

_____ Emergency procedures

_____ Training procedures

_____ Applicable PQS

_____ Space maintenance and upkeep

_____ Written procedures or check lists used

_____ Publications

_____ Paper work or forms completed (MRC cards, etc.)

_____ Any new equipment or procedures expected within the next year?

_____ Physically demanding tasks

Figure 6-8. O&I Check List.

gathering, and filling in details. For the first two days, much of the time is spent in getting a general orientation to the rating and building a framework on which to put the specifics that will be gathered later. Particular attention should be paid at this point to the kinds of work that people do, and how the work is divided up by command, shop within command, NEC, and pay grade. This information will help ensure complete coverage of the rating.

The second, intensive data-gathering phase lasts about a week and includes most of the interviews. During this time much information will be collected, and facts filled in on the framework established in the first phase. Extensive notes should be taken for each interview. As soon as possible after the interviews, notes should be reviewed and details added to make the information more complete. As the interviews progress, lists of job titles, collateral duties, watches, equipments, and task statements should be coordinated among team members, and areas identified in which more information is needed.

During the final few days, most of the time will be spent checking and confirming information, adding less common tasks and equipments and elaborating areas in which there are questions. Fewer notes will be needed, and interviews may be briefer and more specific. At this stage, interviewers will need to make an extra effort to appear interested in what the interviewees say. One way to do this is to develop specific questions about how the job of the specific person being interviewed differs from others.

<u>Documenting What Has Been Learned</u>. The various lists of tasks, equipments, and systems that team members develop by the end of the O&I trip, as well as their many pages of notes, document the specific information learned on the trip. In addition to this, during an O&I trip interviewers form a general impression of the rating, including information on how the work is structured, the types of jobs performed, who performs them, and where they are performed. This is important information. It should also be documented, so that it will be available for job task analysts to use in better understanding the data they receive from the surveys.

-- In order to document this general information, near the end of the O&I trip each interviewer should write a one- to two-page summary of what he or she has learned about the structure of the rating. The summary should be placed in the project summary file. It should include information on the following questions, if possible:

--1. What are the basic types of jobs done in this rating, and are there specific locations where each type is performed?

--2. Do the existing service ratings correspond to the actual divisions in the work of the rating? Do the NEC's?

--3. Are some rating-related tasks sometimes done by people in other ratings, or do people in this rating commonly do the tasks of another rating?

4. Do most people perform most of the tasks at one time or another, or do most people only do a few tasks?

5. Is maintenance of equipment done in a different location from operation?

6. Are particular problems mentioned by many people (for example, lack of training on a certain equipment)?

Step 11 - Prepare Post O&I Trip Report

When the task inventory development team returns to NODAC after O&I, the team project manager prepares a post O&I trip report. A standard outline is followed in preparing this report as shown in Figure 6-9. The report is submitted to the Director of the Data Collection Division (Code 21) who reviews the report to check if the work of the rating has been covered adequately and if the O&I team visited a representative sample of ship and shore activities where job incumbents in the rating are located. Recommendations or suggestions for improving the coverage appear at the end of this report so that they may be taken into consideration the next time that the rating is surveyed. The report is filed in the project summary file as part of the audit trail of the task inventory development process.

When Step 11 is completed, Phase II - Prepare for and Conduct Observations and Interviews (O&I) is concluded. The task inventory development team then moves on to Phase III - Inventory Construction and Review, which is described in detail in Chapter 7.

Step 11 - Prepare Post O&I Trip Report

When the task inventory development team returns to NODAC after O&I, the team project manager prepares a post O&I trip report. A standard outline is followed in preparing this report as shown in Figure 6-9. The report is submitted to the Director of the Data Collection Division (Code 21) who reviews the report to check if the work of the rating has been covered adequately and if the O&I team visited a representative sample of ship and shore activities where job incumbents in the rating are located. Recommendations or suggestions for improving the coverage appear at the end of this report so that they may be taken into consideration the next time that the rating is surveyed. The report is filed in the project summary file as part of the audit trail of the task inventory development process.

When Step 11 is completed, Phase II - Prepare for and Conduct Observations and Interviews (O&I) is concluded. The task inventory development team then moves on to Phase III - Inventory Construction and Review, which is described in detail in Chapter 7.

POST O&I TRIP REPORT

RATING(S)_____

PROJECT MANAGER_____

Information Required

1. Geographic areas visited:

2. Inclusive dates at each area visited:

3. NODAC representatives conducting observation and interviews in areas visited:

4. Total number of commands surveyed:

   a. Ashore _____ .

   b. Afloat _____

5. Names of shore activities visited and name/rank or rate/title and phone number of primary command liaison/point of contact:

6. Name and hull number of each afloat activity visited and name/rank or rate/title of command point of contact:

7. Major intermediate liaison activities and name/rank or rate/title and phone number of individual conducting liaison efforts:

8. Major problems/shortcomings encountered:

9. Positive occurrences worthy of note:

10. Personnel assistance rendered criteria for special consideration (include name/rank or rate/title/command/justification):

11. Total number of personnel interviewed in each rating:

    a. Rating _____   No. _____

    b. Rating _____   No. _____

12. Cost per person - per area:

13. Recommendations/suggestions for future consideration:

Figure 6-9. Outline of Post O&I Trip Report.

6-

HANDBOOK FOR CONSTRUCTION OF TASK INVENTORIES

FOR NAVY ENLISTED RATINGS

CHAPTER 7

INVENTORY CONSTRUCTION AND REVIEW

(PHASE III)
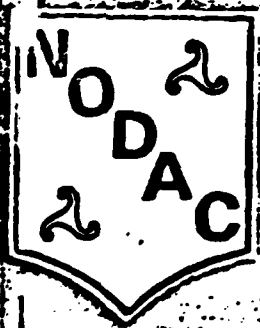
In the third phase of task inventory development, the task inventory developers return to NODAC to construct the task inventory booklet. Then the contents of the task inventory are submitted to several levels of review, both within and outside of NODAC. When the review is complete and all necessary revisions have been made to the task inventory, a final review copy of the inventory with all recommended changes attached is routed up the NODAC chain of command for comment and final approval. The approved task inventory booklet then is prepared for printing, proofed, corrected, and sent to the printer. Figure 7-1 shows a flowchart of the various steps performed in Phase III. Each step is described in detail below.

Step 12 - Construction of Task Inventory

Construction of the task inventory booklet takes place, for the most part, in a series of task inventory development team meetings held immediately after return from the O&I trip. The team member from the Analysis Division is present to he'' assign items to duty categories and to clarify task statements. As the team writes an item, it is typed on the word processing terminal. At the end of each work session, the items written during that session are printed and photocopied, so that each team member may review them before the next work session. During each session after the first one, previously written items are edited and corrections are made using the word processor.

Sections of Task Inventory Booklet. Procedures for constructing a NODAC task inventory booklet result in seven standard sections plus the front material to the booklet and a final NOTE page. The standard sections are listed below and described in detail following the list.

- Front Material

- Section A - Background Information

- Section B - General Quarters, Watches, and Collateral Duties

- Section C - Equipment/Tools/Systems

- Section D - Task Statements

- Section E - Job Satisfaction and Job Importance

- Section F - Physical Standards

- Section G - Miscellaneous Data

- Section H - MI tory

- Final NOTE Page
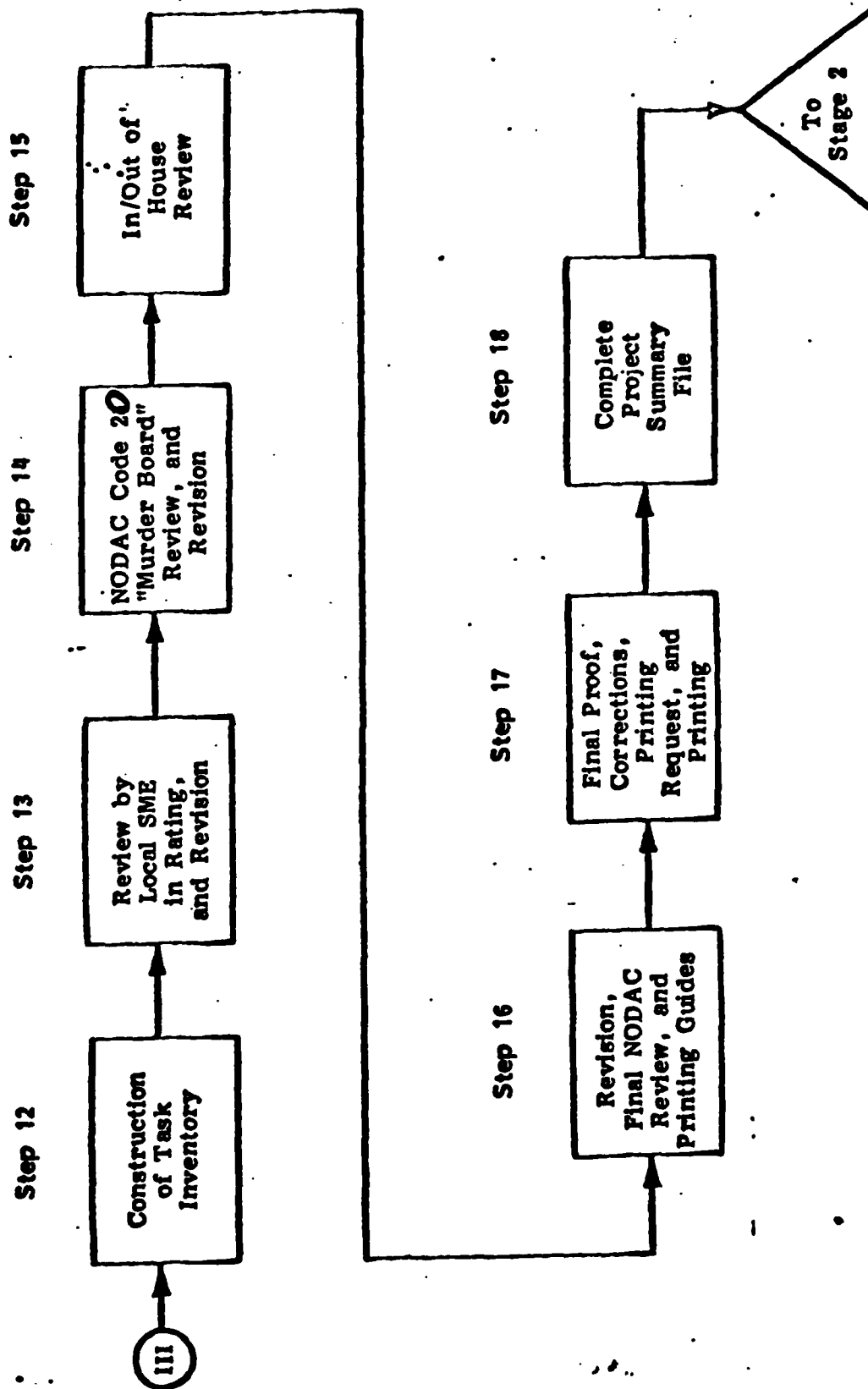
Figure 7-1. Flowchart of Phase III – Inventory Construction and Review.

Front Material. The front material consists of (1) the cover of the task inventory booklet; (2) a page indicating who prepared the inventory, who the technical advisers (subject matter experts) were, and which commands reviewed the inventory prior to its administration; (3) a standard covering letter; and (4) a Privacy Act Statement. Figure 7-2 shows an example of a standard cover for a NODAC task inventory booklet for the Opticalman (OM) rating. The insignia for the rating and the name and abbreviation for the rating are inserted in the center portion of a standard, preprinted NODAC booklet cover. Below the rating name and abbreviation, the month and year that the survey will be administered is also inserted. Figure 7-3 shows an example, also for the OM rating, of the page listing the names of the NODAC team members who prepared the inventory, the SME(s) who provided technical advice, and the commands that reviewed the inventory.

In Figure 7-4, the standard covering letter from the Officer-In-Charge of NODAC to Selected Personnel in the Opticalman (OM) rating is shown. This example letter explains the purpose of the survey, what occupational information the respondent is being asked to furnish, how the survey information will be used, and a reassurance that the survey is not a test. Figure 7-5 reproduces the standard Privacy Act Statement that appears in all NODAC task inventory booklets.

Section A - Background Information. The Background Information section consists of the following three subsections that relate to blocks on the corresponding optical-scannable Response Packet for the survey.

Block 43 - Command Status. The standard instructions for completing Block 43 on page 2 of the Response Packet are shown in Figure 7-6, and the standard list of command status choices is shown in Figure 7-7.

Block 44 - Job Titles. If a job title received less than a 5% response on the previous inventory and it was not mentioned by any job incumbents or supervisors during O&I, it should not be included in the new inventory. However, if it was mentioned by either an incumbent or a supervisor, or if it received at least a 5% response on the previous inventory, it should be included in the new inventory. The list of job titles then is arranged in alphabetical order and numbered sequentially.

The standard instructions for completing Block 44 on page 2 of the Response Packet for the May 1981 Opticalman (OM) task inventory booklet are shown in Figure 7-8. The list of job titles is typed in the format of the example provided in Figure 7-9 which shows the actual list of job titles for the OM rating.

NAVY OCCUPATIONAL
TASK ANALYSIS
PROGRAM
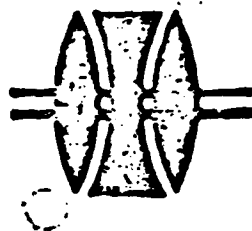
OPTICALMAN
(OM)
MAY 1981

NAVY OCCUPATIONAL
DEVELOPMENT AND ANALYSIS
CENTER

NODAC

NAVAL MILITARY PERSONNEL
COMMAND

Figure 7-2. Example of a Standard Cover for
a NODAC Task Inventory Booklet.

7-4

PREPARED BY:

ICl B.R. GREATHOUSE
ATl J.A. WHITE
AT2 J.L. BOWERS

TECHNICAL ADVISORS:

OMC J.E. DYCKMAN

REVIEWED BY:

CHIEF OF NAVAL OPERATIONS (OP 02, 03, 13D)
COMMANDER NAVAL SEA SYSTEMS COMMAND
CHIEF OF NAVAL EDUCATION AND TRAINING
CHIEF OF NAVAL TECHNICAL TRAINING

Figure 7-3.   Example Page Acknowledging Contributors to and
Reviewers of a NODAC Task Inventory Booklet.

7-5

DEPARTMENT OF THE NAVY
NAVY OCCUPATIONAL DEVELOPMENT AND ANALYSIS CENTER (NODAC)
BUILDING 150, WASHINGTON NAVY YARD (ANACOSTIA)
WASHINGTON, D.C. 20374

NODAC/21:wmv
3950
Ser: 64
2 March 1981

From: Officer-In-Charge, Navy Occupational Development and Analysis Center
To: Selected Personnel in the OPTICALMAN (OM) Rating

Subj: Opticalman (OM) Task Inventory

1. The Commander, Naval Military Personnel Command (CNMPC) has developed an occupational task analysis system for use in analyzing officer and enlisted occupations. The primary purpose is to provide occupational data needed to improve the utilization, training, and assignment of personnel. This system has been comprehensively tested and its operational feasibility, military usefulness, and cost effectiveness have been successfully demonstrated. The system is administered by the Navy Occupational Development and Analysis Center, an activity under the Commander Naval Military Personnel Command (CNMPC), and is called the Navy Occupational Task Analysis Program (NOTAP).

2. You have been selected, as a representative of your rating, to help gather occupational information by furnishing accurate and detailed responses to statements about the duties and responsibilities of your present job. YOU are the EXPERT. Tell us "What" you do; "How" you do it; and "How much time" you spend doing it, as well as answering other related questions and statements about your training, work experiences, equipment worked on, etc.

3. As new technologies are developed and equipment changes are made, it may become necessary to modify the qualification requirements of personnel in your occupational field. Your responses will contribute toward the updating of related school curricula, occupational standards, rate training manuals, and advancement in rate exams in order to meet the changing demands on Navy personnel.

4. With your help the Navy Occupational Task Analysis Program can go a long way toward starting the ball rolling in the right direction. Please keep in mind—THIS IS NOT A TEST—THERE ARE NO SCORES—NO PASSING OR FAILING GRADES. Just say how it is done now. This information will help in determining what should be and will be of future value to you and to those yet to come aboard.

J. K. Todaro

J. K. TODARO
Acting

Figure 7-4. Example of the Standard Inventory Covering
Letter from the Officer-In-Charge of NODAC.

PRIVACY ACT STATEMENT

    Authority to request this information is derived from 5 USC 301, Departmental Regulations. The purpose of this information is to determine what specific tasks are being performed by job incumbents and for analysis and comparison between groupings of individuals within a rating. The data will be used in updating training school curricula and advancement examinations, revising occupational standards and rate training manuals, in developing training requirements and NECs, and in personnel and related health research. Completion of this information is mandatory. Failure to provide the required data may result in administrative action being taken.

Figure 7-5.   Standard Privacy Act Statement.

Page 2 of the Response Packet, Block 43

The following section is a list that contains possible employments of your command. From the list select the one employment category (Command Status) that most accurately describes the present employment of your command. If an appropriate Command Status does not appear in the listing, enter "00" in Block 43 and write your Command Status on the ADD-ON Sheet provided.

EXAMPLE:

BLOCK 43. COMMAND STATUS

01. PREPARATION FOR OVERSEAS MOVEMENT (POM)/PRE-DEPLOYMENT WORKUPS (30 DAYS PRIOR TO SCHEDULED DEPLOYMENT).

02. DEPLOYED.

03. POST-DEPLOYMENT STAND-DOWN (30 DAYS AFTER DEPLOYMENT).

If your present Command Status is DEPLOYED you would mark Block 43 as follows:

Figure 7-6. Standard Instructions for Completing Block 43 - Command Status of the NODAC Task Inventory Response Packet.

BLOCK 43. COMMAND STATUS

01. PREPARATION FOR OVERSEAS MOVEMENT (POM)/PRE-DEPLOYMENT WORKUPS (30 DAYS PRIOR TO SCHEDULED DEPLOYMENT)

02. DEPLOYED

03. POST-DEPLOYMENT STAND-DOWN (30 DAYS AFTER DEPLOYMENT)

04. HOMEPORT/HOMEBASE LOCAL OPERATIONS (NOT INCLUDING SHIPYARD, TENDER, OR RESTRICTED AVAILABILITY)

05. TENDER/RESTRICTED AVAILABILITY, LEAVE AND UPKEEP

06. SHIPYARD OVERHAUL

07. SHIPBOARD INSPECTION (REFRESHER TRAINING, INSURV, ORE/ORI, NWAI/NTPI) SCHEDULED TO BE HELD WITHIN THREE WEEKS

08. CONUS ASHORE

09. OVERSEAS SHORE BASE

10. SHORE BASE INSPECTIONS, CONUS OR OVERSEAS (MATERIAL READINESS, ORE/ORI, ADMAT, ETC.) SCHEDULED TO BE HELD WITHIN THREE WEEKS

Figure 7-7. Standard List of Command Status Choices in a NODAC Task Inventory.

BLOCK 44. JOB TITLES

Page 2 of the Response Packet, Block 44

The following section is a list of Job Titles held by personnel in your rating. From the list, select ONLY ONE Job Title that most accurately describes your primary job at your present command. If an appropriate Job Title does not appear in the listing, enter "OU" in Block 44 and write your Job Title on the ADD-ON Sheet provided.

EXAMPLE:

BLOCK 44. JOB TITLES

01. ASSISTANT DIVISION OFFICER

02. DIVISION OFFICER

03. LEADING CHIEF PETTY OFFICER

The first three job titles in the actual list for the rating are inserted here.

If in your present job, you are primarily a DIVISION OFFICER you would mark Block 44 as follows:

Job title 02 above.

Figure 7-8. Standard Instructions for Completing Block 44 – Job Titles of the NODAC Task Inventory Response Packet.

BLOCK 44.   JOB TITLES

01. ASSISTANT DIVISION OFFICER

02. DIVISION OFFICER

03. LEADING CHIEF PETTY OFFICER

04. LEADING PETTY OFFICER

05. MAINTENANCE DATA COLLECTION SYSTEM (MDCS) COORDINATOR

06. OPTICAL ALIGNMENT TEAM MEMBER

07. PERISCOPE REMOVAL/INSTALLATION TEAM MEMBER

08. PERISCOPE REPAIR SUPERVISOR

09. QUALITY ASSURANCE (QA) SUPERVISOR

10. SHIP SUPERVISOR/SUPERINTENDENT

11. SHOP SUPERVISOR

12. SMALL INSTRUMENT REPAIRMAN

13. SUPPLY PETTY OFFICER

14. WORK CENTER SUPERVISOR

Figure 7-9.   Example of a List of Job Titles
from a NODAC Task Inventory.

Block 45 - Work Location. If a work location received less than a 5% response on the previous inventory and it was not mentioned by any job incumbents or supervisors during O&I, it should not be included in the new inventory. However, if it was mentioned by either an incumbent or a supervisor, or if it received at least a 5% response on the previous inventory, it should be included in the new inventory. The list of work locations then is arranged in alphabetical order and numbered sequentially.

The standard instructions for completing Block 45 on page 2 of the Response Packet are shown in Figure 7-10. The list of work locations is typed in the format of the example provided in Figure 7-11 which shows the list of work locations for the OM task inventory booklet. At the bottom of the last page of the list of work locations, the following instructions should appear.

END OF SECTION A
CONTINUE TO NEXT SECTION

Section B - General Quarters, Watches, and Collateral Duties. If an item in the general quarters, watches, and collateral duties list of Section B received less than a 5% response on the previous inventory and it was not mentioned by any job incumbents or supervisors during O&I, it should not be included in the new inventory. However, if it was mentioned by either an incumbent or a supervisor, or if it received at least a 5% response on the previous inventory, it should be included in the new inventory. In Section B, general quarters, watches, and collateral duties should be listed under three separate headings. Under each heading, the duties are arranged in alphabetical order, and the entire list is numbered sequentially.

The standard instructions for completing Section B on page 3 of the Response Packet are shown in Figure 7-12. The list of general quarters, watches, and collateral duties is typed in three separate groups in the format of the example provided in Figure 7-13 which shows the Section B duties for the May 1981 Opticalman (OM) task inventory booklet. At the bottom of the last page of Section B, the following instructions should appear.

END OF SECTION B
CONTINUE TO NEXT SECTION

BLOCK 45. WORK LOCATION

Page 2 of the Response Packet, Block 45

Indicate in Block 45 the work location where you spend the majority of your time performing the job you marked previously. If an appropriate Work Location does not appear in the listing, enter "00" in Block 45 and write in your Work Location on the ADD-ON Sheet provided.

EXAMPLE:

BLOCK 45. WORK LOCATION

01. DIVISION OFFICE

02. OPTICAL SHOP

03. PLANNING AND ESTIMATING OFFICE

The first three work locations in the actual list for the rating are inserted here.

If you are presently assigned to the OPTICAL SHOP you would mark Block 45 as follows:

Work location 02 above.

45.
WORK
LOCA-
TION

Figure 7-10. Standard Instructions for Completing
Block 45 - Work Location of the NODAC
Task Inventory Response Packet.

BLOCK 45.   WORK LOCATION

01.   DIVISION OFFICE

02.   OPTICAL SHOP

03.   PLANNING AND ESTIMATING OFFICE

04.   QUALITY ASSURANCE SHOP

05.   REPAIR OFFICE

END OF SECTION A
CONTINUE TO NEXT SECTION

Figure 7-11.   Example of a List of Work Locations
from a NODAC Task Inventory.

Page 3 of the Response Packet, Section B

This section is used to identify the General Quarters, watch, and collateral duty assignments that are performed by personnel in your rating.

From the list, select all the General Quarters stations, watches, and collateral duties that you perform in your present job, and under the corresponding number indicate that you perform that duty. If there are GENERAL QUARTERS, WATCHES, or COLLATERAL DUTIES you perform that are not listed write them on the ADD-ON SHEET provided.

NOTE: If you do not perform a General Quarters station, watch, or collateral duty listed, leave the item number blank.

EXAMPLE:

SECTION B. GENERAL QUARTERS, WATCHES, AND COLLATERAL DUTIES

01.   ASSISTANT GUNNERY OFFICER

02.   FORWARD/AFT BATTLE DRESSING STATION

03.   GUN MOUNT SAFETY OBSERVER

First three duties in the actual list.

If in your present job, you are assigned to a FORWARD/AFT BATTLE DRESSING STATION under Item #2 you would mark as follows:

B. GENERAL QUARTERS, WATCHES, AND COLLATERAL DUTIES

Item Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
I Perform	○	●	○	○	○	○	○	○	○	○	○	○	○	○	○

Duty 02 above.

Figure 7-12.   Standard Instructions for Completing Section B - General Quarters, Watches, and Collateral Duties of the NODAC Task Inventory Response Packet.

SECTION B. GENERAL QUARTERS, WATCHES, AND COLLATERAL DUTIES

GENERAL QUARTERS:

01. ASSISTANT GUNNERY OFFICER

02. FORWARD/AFT BATTLE DRESSING STATION

03. GUN MOUNT SAFETY OBSERVER

04. OPTICAL SHOP

05. REPAIR PARTY MEMBER

WATCHES:

06. AFTERSTEERING

07. ASSISTANT DUTY MASTER-AT-ARMS

08. BRIG WATCH

09. COMBAT INFORMATION CENTER (CIC)

10. DUTY DRIVER

11. DUTY FIRE MARSHALL

12. DUTY FIRE PARTY

13. DUTY LEADING CHIEF PETTY OFFICER (LCPO)

14. DUTY LEADING PETTY OFFICER (LPO)

15. DUTY MASTER-AT-ARMS

16. DUTY REPAIR OFFICER

17. HELMSMAN

18. JUNIOR OFFICER OF THE DECK

19. LEE HELMSMAN

20. LOOKOUT

21. MESSENGER OF THE WATCH

22. OFFICER OF THE DECK (OOD)

23. PETTY OFFICER OF THE WATCH

24. PHONE TALKER

25. PIER SENTRY

26. RESCUE AND ASSISTANCE DETAIL

27. ROVING SECURITY PATROL

28. SECURITY ALERT TEAM MEMBER

Figure 7-13. Example of Section B Duties from
a NODAC Task Inventory.

29. WEAPONS SECURITY SENTRY

COLLATERAL DUTIES:

30. ALCOHOL/DRUG ABUSE PETTY OFFICER

31. CAREER COUNSELOR

32. DAMAGE CONTROL PETTY OFFICER (DCPO)

33. EQUIPMENT CALIBRATION PETTY OFFICER

34. HUMAN RELATIONS COUNCIL

35. MAINTENANCE DATA COLLECTION SYSTEM (MDCS) COORDINATOR

36. MANHOUR ACCOUNTING PETTY OFFICER

37. PERSONNEL QUALIFICATION STANDARDS (PQS) PETTY OFFICER

38. PLANNED MAINTENANCE SYSTEM (PMS) COORDINATOR

39. QUALITY ASSURANCE INSPECTOR

40. QUALITY CONTROL INSPECTOR

41. SAFETY PETTY OFFICER

42. SUPPLY PETTY OFFICER

43. TRAINING PETTY OFFICER

44. WEIGHT TESTING RECALL COORDINATOR

END SECTION B
CONTINUE TO NEXT SECTION

Figure 7-13.   Example of Section B Duties from
a NODAC Task Inventory (Cont.).

Section C - Equipment/Tools/Systems. If an item in the equipment/tools/ systems list of Section C received less than a 5% response on the previous inventory and it was not mentioned by any job incumbents or supervisors during O&I, it should not be included in the new inventory. However, if it was mentioned by either an incumbent or a supervisor, or if it received at least a 5% response on the previous inventory, it should be included in the new inventory. In Section C, the items should be listed under two separate headings, each in alphanumeric order: (1) equipment/tools/systems, and (2) publications/reports/forms/logs/records. The entire two-part list then is numbered sequentially.

The standard instructions for completing Section C on page 4 of the Response Packet are shown in Figure 7-14 where the respondent is instructed to consider how often the equipment/tool/system is used (Section C-1) and how often it is repaired (Section C-2). The equipment/tools/systems list is typed in the format of the example provided in Figure 7-15 which shows a portion of Section C for the January 1981 Operations Specialist (OS) task inventory booklet. At the bottom of the last page of Section C, the following instructions should appear.

<div align="center">
END OF SECTION C
CONTINUE TO NEXT SECTION
</div>

Page 4 of the Response Packet, Section C

The following section is a list of equipment, tools, and systems that are used and/or repaired by personnel in your rating. This section identifies what equipment, tools, or systems you use or repair in your present job.

From the list select all the equipment, tools, or systems that you use and/or repair in your present job, and under the corresponding number indicate the frequency of your action. If you both use and repair an item make a selection in both sections C-1 and C-2 for that item.

NOTE: If you do not use or repair an item listed, leave the item number blank.

NOTE: The term "Repair" in this section DOES NOT include Operator Maintenance, Preventive Maintenance, or Inserting Changes to Publications.

EXAMPLE:

SECTION C. EQUIPMENT/TOOLS/SYSTEMS

1. ACETYLENE TORCH

2. ADDING MACHINES/CALCULATORS   First three duties in the Mineman list.

3. AIR COMPRESSOR

If in your present job, you use an ACETYLENE TORCH daily, and you do not repair it, under item #1 you should mark as indicated below:

Item 01 above.

C. EQUIPMENT/TOOLS/SYSTEMS

Item Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14
										C-1 HOW OFTEN DO YOU USE?				
At Least Once A Year	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙
At Least Once A Month	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙
At Least Once A Week	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙
Daily	●	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙
										C-2 HOW OFTEN DO YOU REPAIR?				
At Least Once A Year	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙
At Least Once A Month	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙
At Least Once A Week	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙
Daily	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙

NOTE: If you use or repair an item not listed, write it in the appropriate blank on the ADD-ON sheet which has been provided by your proctor. Indicate how often you perform that action under the corresponding number in the section below the blanks.

Figure 7-14.   Standard Instructions for Completing
Section C - Equipment/Tools/Systems
of the NODAC Task Inventory
Response Packet.

SECTION C. EQUIPMENT/TOOLS/SYSTEMS

1. ALIDADE

2. AN/APX-72 IFF TRANSPONDER SET

3. AN/GRC-20 RADIO

- •
- •
- •

86. MICROFICHE READER

87. MK8/MK9 COMPUTER (CIRCULAR SLIDE RULER)

88. MULTICHANNEL (MC) SYSTEMS (21-MC, 22-MC, 35-MC, ETC.)

- •
- •
- •

125. UNIVERSAL KEY SET

126. WEIGHTED EMERGENCY DESTRUCTION BAG

127. AIR CONTACT LOG

128. AIR INTERCEPT LOG

- •
- •
- •

151. FLEET EXERCISE PUBLICATIONS

152. INTERNATIONAL SIGNALS

153. MANUFACTURERS TECHNICAL MANUALS

- •
- •
- •

174. TOTE BOARD (BOGEY/CAP)

175. VOICE CALL SIGN BOARD

176. WEAPONS PLOT

END OF SECTION C
CONTINUE TO NEXT SECTION

Figure 7-15. Partial Example of Section C Items
from a NODAC Task Inventory.

Section D - Task Statements. From information collected during the O&I phase, task inventory development team members write task statements, making certain that all tasks performed by job incumbents in the rating are covered. Also, the quantity of tasks written under each duty category should be generally proportionate to the amount of work performed in that functional area so that accurate time-spent data will be collected by the task inventory.

Specific guidelines for writing acceptable task statements can be found in Appendix D. However, the key rules to keep in mind are the following.

- A task statement should start with an action verb in the present tense, with the subject of the sentence understood to be "I" (for example, FILL OUT, INSTALL, LUBRICATE, PREPARE, SCREEN, UPDATE).

- A task statement should contain only one action verb and one object of the action verb (for example, LUBRICATE ANALOG COMPUTER, MEASURE VOLTAGE, REPAIR ELECTROMECHANICAL VALVES, SPLICE WIRES).

- Validate the verb against the list of standard NODAC action verbs (see Appendix C) to make certain the meaning is correct. New verbs are acceptable. However, they must be defined for addition to the standard list, and they must meet task inventory development requirements. In order to keep the number of verbs to a minimum, a new verb should not be added if it is nearly the same as an existing verb on the list.

- Two action verbs may be used only when they are almost always performed together (for example, ADJUST/ALIGN OPTICAL EQUIPMENT, CLEAN/INSPECT EQUIPMENT COOLING SYSTEM, REMOVE/REPLACE RELAYS). Two objects should never be included in one task statement.

- A task statement should not include a qualifier unless the qualifier is absolutely essential to the meaning of the task (for example, ISOLATE FAULTY CIRCUIT IN BALLISTIC MISSILE, PACKAGE FILES FOR TRANSMITTAL TO FEDERAL RECORDS CENTER, REMOVE/REPLACE PRINTED CIRCUIT BOARDS ON TEST EQUIPMENT).

- The task reflected in the task statement must be time measurable. That is, the job incumbent should be able to judge the time spent on the task relative to time spent on all other tasks in the inventory.

- Each task statement must be mutually exclusive of every other task statement in the inventory. That is, task statements must not overlap each other in any way, such as the first task being one step in the performance of some other task.

- All task statements in a task inventory should be written at the same level of work specificity.

- The task must be appropriate to the job/rating or general duty.

- Write short, concise task statements.

- Avoid ambiguity. The task statement should mean the same thing for all incumbents in the rating.

- Use abbreviations cautiously. If they are essential to the meaning of the task, spell out the formal term first and follow it with the abbreviation in parentheses.

- Avoid fabricated words or terms.

- Avoid jargon unless that is the only way to describe the task.

Next, make certain that those tasks covering an occupational standard are included in the list of task statements. Examine the updated task list to determine if each "A" school learning objective is covered by a task statement. If the learning objective is not covered, write a new task statement to cover it. The list of task statements then is compared against the previous inventory booklet. The flowchart shown in Figure 7-16 may be a help in comparing new task statements against old statements in the previous inventory booklet. The list is also compared to the most recent list of standard task statements prior to this one, making certain that the wording of standard statements is consistent. If the task inventory being developed is for one of the aviation ratings, then the most recent list of standard task statements for an aviation rating should be the basis for comparison.

Next, related tasks are grouped into standard duty categories provided by the task inventory development team project manager. For some ratings, the standard duty categories are not appropriate, and a logical grouping with new duty category titles must be developed. The task statements are placed in a logical sequence under each duty category, and the duty categories are placed in a logical sequence in Section D.

For each rating, the task inventory contains a standard set of duty categories covering damage control, general shipboard duties, training, and administration. The list of current items and duty categories should be obtained from the most recent NOTAP inventory and added at the end of Section D. All of the rearranged task statements then are numbered sequentially. The representative to the task inventory development team from the Analysis Division (Code 23) assists during this process. The duty categories used in reorganizing the list of task statements are identified by their standard letter code, and this list of duty categories is typed for in-house review.
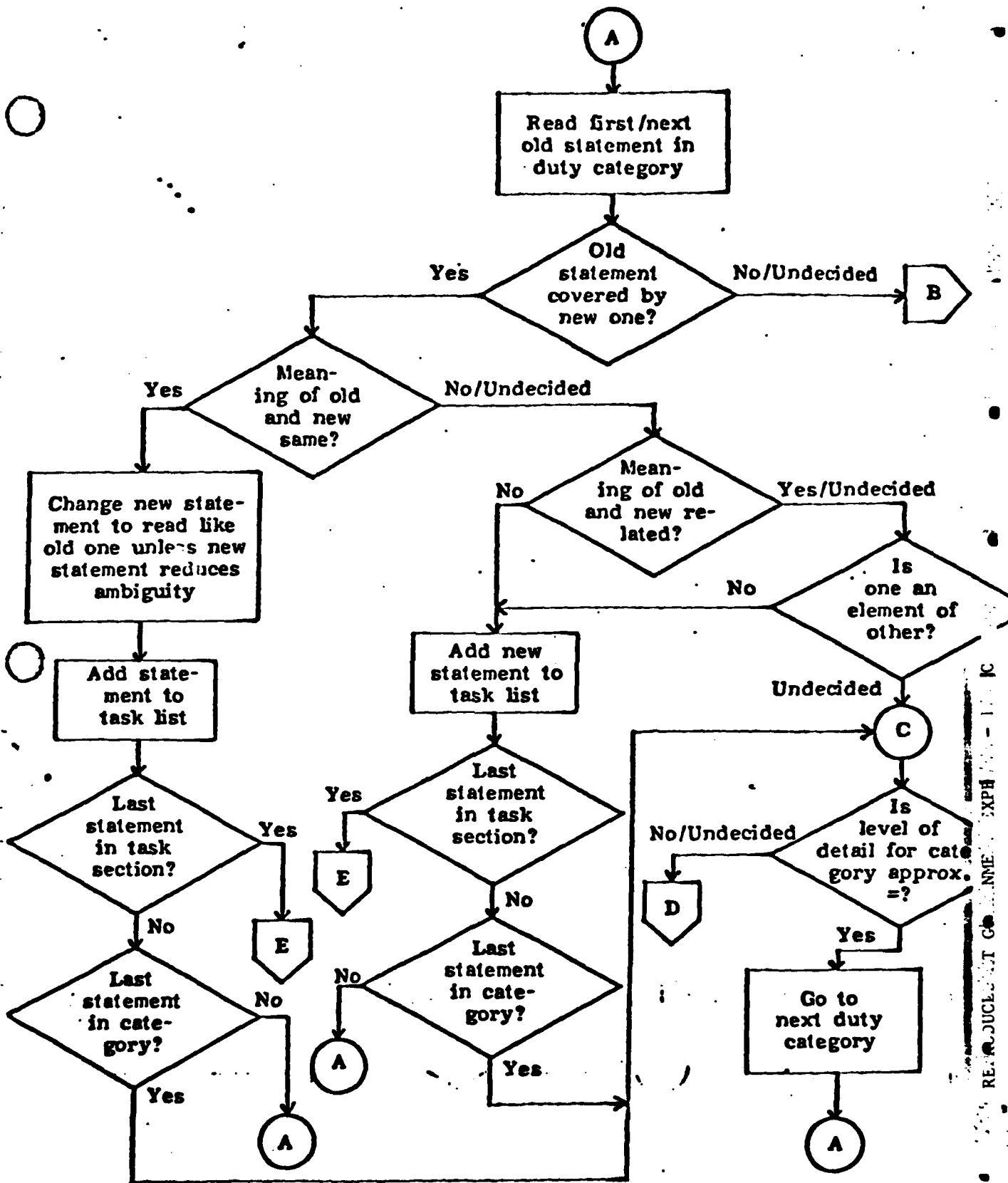
Figure 7-16. Flowchart for Comparing New Task Statements Against Old Statements in Previous Inventory Booklet.
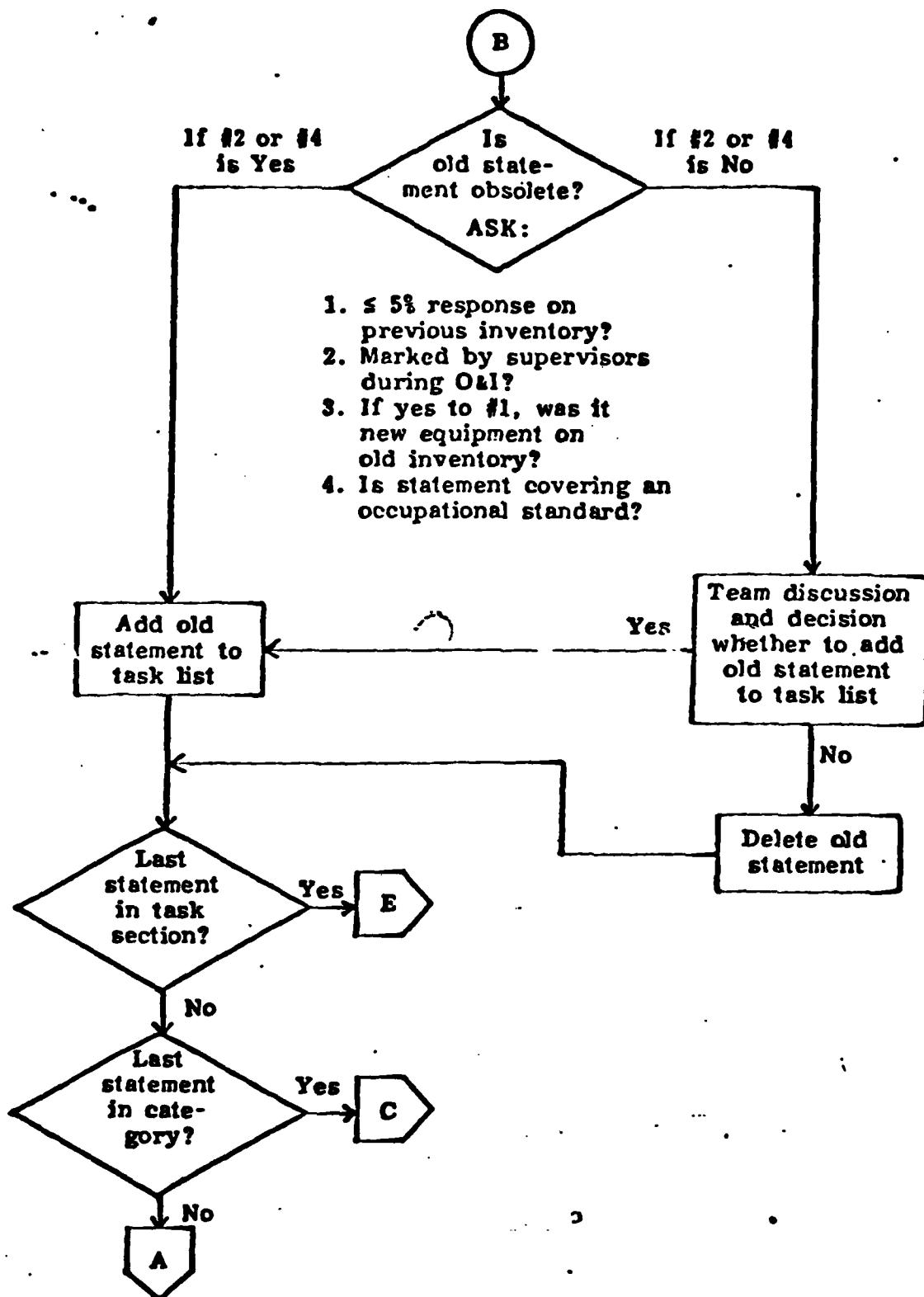
Figure 7-16. Flowchart for Comparing New Task Statements Against Old Statements in Previous Inventory Booklet (Cont.).
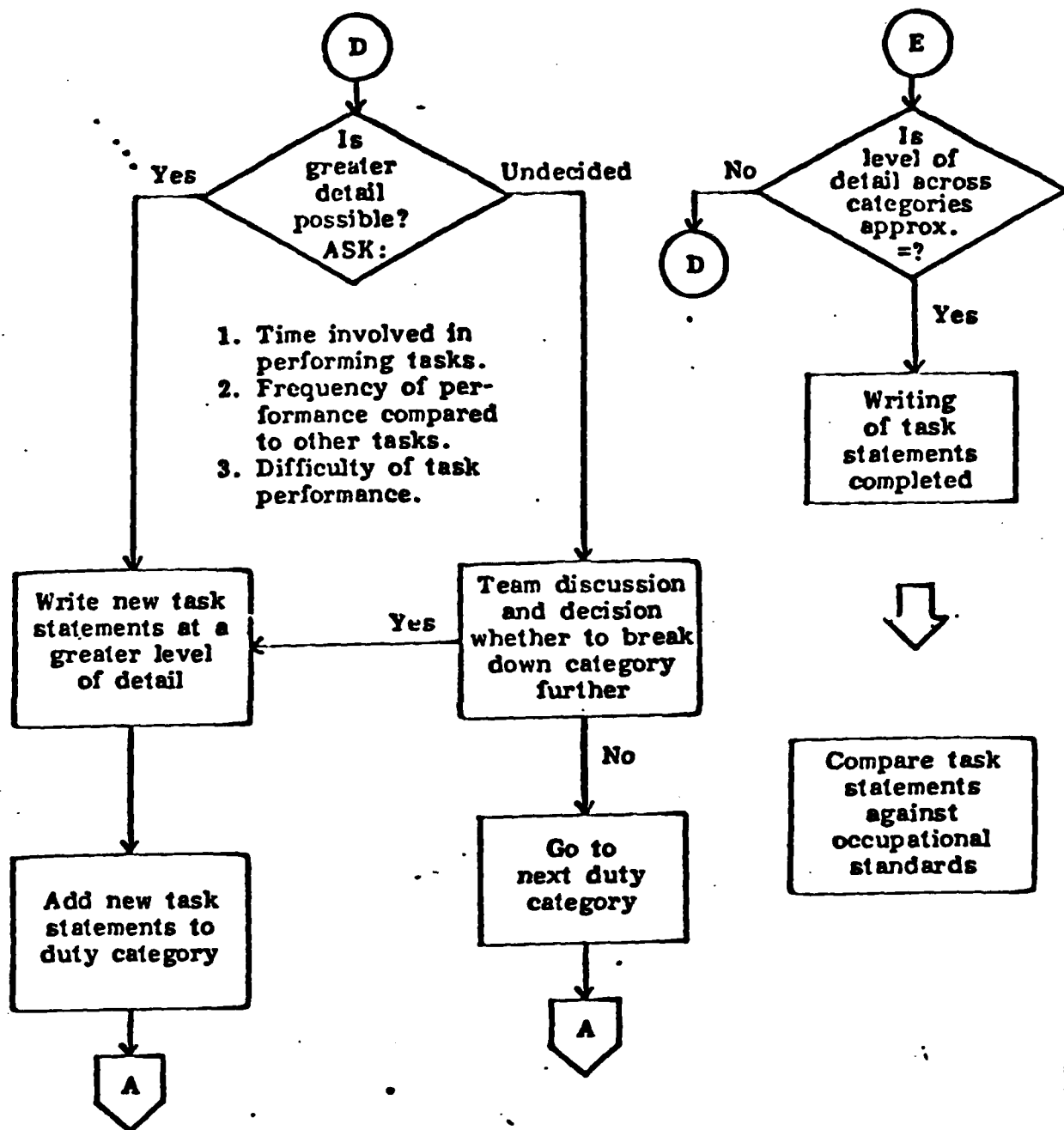
Figure 7-16.   Flowchart for Comparing New Task Statements Against
Old Statements in Previous Inventory Booklet   (Cont.).

The task inventory development team then reviews the rearranged list of
task statements to double check that all occupational standards have been
covered, and a list of occupational standards not covered by any task state-
ment is developed.

The standard instructions for completing Section D on page 10 of the
Response Packet are shown in Figure 7-17. The list of task statements is
printed in the format of the example provided in Figure 7-18 which shows a
portion of Section D for the January 1981 Machinery Repairman (MR) task
inventory booklet. Although the task statements are grouped by duty cate-
gories, the headings for the categories are not included, and there is no
separation between the tasks of different duty categories. The reason duty
category headings are not included is to prevent respondents from being able
to skip over an entire duty category. Respondents may think they do not
perform that duty when in fact they actually do perform some of the tasks in
the category.

On the first page of Section D, the following instruction appears under
the name of the section:

RESPONSES REQUIRED IN D-1 AND D-2

This instruction alerts the inventory respondent that each task performed
needs to be considered twice. First, the respondent marks in Section D-1 the
capacity in which he or she performs the task (the secondary factors I ASSIST,
I DO, I SUPERVISE). Second, the respondent evaluates how much time is spent
on that task relative to all other tasks performed and marks the relative
time spent on a 7-point scale in Section D-2.

At the bottom of the last page of Section D, the following instructions
should appear.

END OF SECTION D
CONTINUE TO NEXT SECTION

Section E - Job Satisfaction and Job Importance. The Job Statisfaction
and Job Importance section is a standard section and is included in all NODAC
task inventory booklets. The standard instructions for completing Section E
on page 25 of the Response Packet are shown in Figure 7-19. Items pertaining
to job and career satisfaction are responded to on a 5-point scale in Section
E-1. Importance of the satisfaction for the item is marked on a 5-point
scale in Section E-2.

The three pages of standard items included in Section E are shown in
Figure 7-20. At the bottom of the last page of Section E, the following
instructions should appear.

END OF SECTION E
CONTINUE TO NEXT SECTION

SECTION D. TASK STATEMENTS

Page 10 of the Response Packet, Section D

The following section is a list of task statements that are performed by personnel in your rating. They are used to identify what you do in your present job.

From the list, select all the task statements that apply to you when you perform your present job. Under the corresponding number, evaluate how much time is spent on that task (relative to all other tasks performed by you) and in what capacity you perform that task.

NOTE: If a task statement does not apply to you when you perform your present job, leave the item blank.

NOTE: A mark under a task number of Part D-1 requires a corresponding mark to be made in that same column of Part D-2.

EXAMPLE:

SECTION D. TASK STATEMENTS

01. INSPECT AZIMUTH AND BEARING CIRCLES

02. CLEAN/LUBRICATE COMPONENT PARTS OF AZIMUTH AND BEARING CIRCLES

03. REMOVE/REPLACE COMPONENTS OF AZIMUTH AND BEARING CIRCLES

First three task statement in the OM list.

If in your present job, you Clean/Lubricate Component Parts Of Azimuth and Bearing Circles and you spend very much time performing that task, under item #2 you would mark as follows:

D. TASK STATEMENTS

Task Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
								D-1 MY INVOLVEMENT IN TASK							
I Assist (Helper Relationship)	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙
I Do	⊙	●	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙
I Supervise	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙
								D-2 HOW MUCH TIME IS SPENT ON TASK?							
Very Little (Min.)	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙
	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙
	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙
	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙
	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙
	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙
Very Much (Max.)	⊙	●	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙

NOTE: If there are other tasks that you perform that have been omitted from this inventory and should be included, fill them in on an ADD-ON SHEET which will be provided by your proctor. Write the task as you perform it and mark boxes D-1 and D-2 as you have just done in this part of the inventory.

Figure 7-17. Standard Instructions for Completing Section D - Task Statements of the NODAC Task Inventory Response Packet.

SECTION D. TASK STATEMENTS
(RESPONSES REQUIRED IN D-1 AND D-2)

1. SELECT TYPE OF STOCK TO BE USED IN MANUFACTURING REPAIR/REPLACEMENT COMPONENTS

2. MANUFACTURE SPECIAL TOOLS/ADAPTERS (TAPS, DIES, CUTTERS, ETC.)

3. MANUFACTURE SPROCKETS

        •
        •
        •

78. TAKE MEASUREMENTS IN PLACE FOR SHOP MANUFACTURE

79. CUT/HONE VALVE SEATING SURFACES IN PLACE (GATE, GLOBE, DISC)

80. RESURFACE FLANGES IN PLACE (SHORTCUT)

        •
        •
        •

151. MACHINE SURFACE OF END BELL HOUSINGS

152. MILL PLASTIC COMPONENTS

153. CONSTRUCT GEOMETRIC FORMS

154. COMPUTE AREAS AND VOLUMES

        •
        •
        •

222. ENSURE WORK ASSIGNED TO SUBORDINATES IS COMPLETED

223. COORDINATE WORK WITHIN DIVISION

224. EXAMINE DEFECTIVE COMPONENTS TO DETERMINE FEASIBILITY OF REPAIR

        •
        •
        •

295. CONDUCT MEETINGS, SEMINARS, OR CONFERENCES

296. SIGN OFF PERSONNEL ADVANCEMENT REQUIREMENT (PAR)

297. DISTRIBUTE SAFETY MATERIAL (PUBLICATIONS/POSTERS)

END OF SECTION D
CONTINUE TO NEXT SECTION

Figure 7-18. Partial Example of Section D Items
from a NODAC Task Inventory.

7-28

REPRODUCED AT GOVERNMENT EXPENSE - NODAC

Page 25 in the Response Packet, Section E

The statements which you will read are not intended to invade your privacy as an individual or compromise your position as a member of the U..S. Navy. They are designed to provide you with a way of expressing how you feel about your job and the environment in which you work. Your responses provide information which is studied and considered when making decisions related to your rating.

From the list select all the items that you feel apply to you in your present job. Under these items in section E-1 (Job and Career Satisfaction), make an entry that expresses your satisfaction or dissatisfaction with that specific item. In section E-2 (Importance of Satisfaction Item), make an entry that expresses how important satisfaction in this item is to you in your present job.

NOTE: If an item does not apply to you, then that item should be left blank in the response booklet. If a mark is placed in section E-1 then a mark is required in section E-2.

EXAMPLE:

SECTION E. JOB SATISFACTION AND JOB IMPORTANCE

01. OPPORTUNITY FOR ADVANCEMENT

02. OPPORTUNITY FOR PRESTIGE & STATUS WITHIN YOUR ORGANIZATION

03. OPPORTUNITY TO DO WORTHWHILE WORK

First three items in the standard list.

If in your present job you are satisfied with the OPPORTUNITY TO DO WORTHWHILE WORK, and it is very important to you, under Item #3 you would mark as follows:

E-1 JOB AND CAREER SATISFACTION

Item Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Very Dissatisfied	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙
Dissatisfied	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙
Neither Sat. Nor Dissat.	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙
Satisfied	⊙	⊙	●	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙
Very Satisfied	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙

E-2 IMPORTANCE OF SATISFACTION ITEM

Not Important (Min.)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙
	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙
	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙
	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙
Very Important (Max.)	⊙	⊙	●	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙

Figure 7-19. Standard Instructions for Completing Section E - Job Satisfaction and Job Importance of the NODAC Task Inventory Response Packet.

01. OPPORTUNITY FOR ADVANCEMENT

02. OPPORTUNITY FOR PRESTIGE AND STATUS WITHIN YOUR ORGANIZATION

03. OPPORTUNITY TO DO WORTHWHILE WORK

04. RECOGNITION FOR WORK DONE

05. JOB APPEAL

06. JOB CHALLENGE

07. TOOLS/EQUIPMENT AVAILABLE TO DO THE JOB

08. REPAIR PARTS/CONSUMABLE SUPPLIES AVAILABLE TO DO THE JOB

09. FREEDOM TO DO THE ENTIRE JOB

10. VARIETY OF WORK WITHIN YOUR JOB

11. OPPORTUNITY TO SEE WORK RESULTS

12. OPPORTUNITY TO CONTRIBUTE TO JOB COMPLETION/WORK TEAM EFFORT

13. ACCEPTANCE OF YOUR RECOMMENDATIONS/SUGGESTIONS

14. OPPORTUNITY TO HELP OTHERS

15. FREEDOM FROM JOB PRESSURES

16. FREEDOM FROM FREQUENT JOB CHANGES WITHIN THE ACTIVITY

17. GUIDANCE RECEIVED TO DO THE JOB

18. ON-THE-JOB TRAINING

19. FORMAL SCHOOL TRAINING FOR THE JOB

20. OPPORTUNITY TO DEMONSTRATE YOUR CAPABILITIES

21. OPPORTUNITY TO DECIDE HOW WORK IS TO BE DONE (FREEDOM TO MAKE WORK RELATED DECISIONS)

22. OPPORTUNITY TO DO THE JOB FOR WHICH YOU ARE BEST QUALIFIED

23. OVERALL JOB

24. COMPETENCE OF SUPERVISORS

25. WORKING RELATIONSHIPS WITH SUPERVISORS

26. COMPETENCE OF CO-WORKERS/PEERS

27. WORKING RELATIONSHIPS WITH CO-WORKERS/PEERS

28. COMPETENCE OF SUBORDINATES

29. WORKING RELATIONSHIPS WITH SUBORDINATES

Figure 7-20. Standard Items Included in Section E
of a NODAC Task Inventory.

30. WORK SURROUNDINGS (SAFETY)

31. WORK SURROUNDINGS (COMFORT)

32. UTILIZATION OF GOVERNMENT MONEY

33. UTILIZATION OF GOVERNMENT MATERIAL

34. UTILIZATION OF PERSONNEL

35. UTILIZATION OF YOUR TIME

36. STABILITY OF COMMAND SCHEDULE.

37. TEMPO OF JOB ACTIVITY

38. OVERALL MILITARY CAREER

   Utilize your entire Naval experience in formulating your response to the items
listed below. Indicate your level of satisfaction in section E-1 with those items with
which you have had contact or experience. For each item marked also indicate its
importance to you in section E-2.

39. WORK HOURS AT SEA

40. WATCH HOURS AT SEA

41. WORK HOURS IN PORT

42. WATCH HOURS IN PORT

43. DUTY HOURS IN PORT

44. AMOUNT OF LIBERTY IN HOME PORT

45. AMOUNT OF LIBERTY AWAY FROM HOME PORT

46. TIME ON DEPLOYMENT/AT SEA LOCAL OPERATIONS

47. TIME ON TAD/TDY

48. OPPORTUNITY TO INFLUENCE LOCATION OF DUTY STATION

49. OPPORTUNITY TO INFLUENCE TYPE OF DUTY ASSIGNED

50. PAY/ALLOWANCES

51. PRESENT DUTY STATION

52. BEQ/BARRACKS

53. SHIPBOARD LIVING SPACES

54. AVAILABILITY OF ON-BASE HOUSING

55. QUALITY OF ON-BASE HOUSING

56. AVAILABILITY OF OFF-BASE HOUSING

57. QUALITY OF OFF-BASE HOUSING

Figure 7-20. Standard Items Included in Section E
              of a NODAC Task Inventory (Cont.).

58. NAVY EXCHANGE/PX/SHIP'S STORE

59. COMMISSARY

60. RECREATION SERVICES

61. DENTAL SERVICES

62. MEDICAL SERVICES FOR YOURSELF

63. MEDICAL SERVICES FOR YOUR DEPENDENTS

64. RETIREMENT PLAN

65. COUNSELING SERVICES (FAMILY, CAREER, PERSONAL)

66. LENGTH OF SEA TOUR

67. LENGTH OF SHORE TOUR

END OF SECTION E
CONTINUE TO NEXT SECTION

Figure 7-20. Standard Items Included in Section E
of a NODAC Task Inventory (Cont.).

Section F - Physical Standards. The task inventory development team compiles a master list of physically demanding tasks from all demanding tasks nominated during O&I. The tasks are ranked in order of frequency of nomination. .The team then omits any tasks that do not require much strength or stamina compared to the others on the list, and notes the tasks that are general shipboard duties rather than rating-related. The 20 highest ranking tasks that are rating-related are selected for inclusion in the final inventory booklet. If the rating does not have 20 physically demanding tasks (for example, Personnelman or Yeoman), the list is supplemented with the highest ranking general shipboard duties.

The standard instructions for completing Section F on page 27 of the Response Packet are shown in Figure 7-21. The list of tasks selected for inclusion in Section F is arranged in the format of the example provided in Figure 7-22 in which the first two tasks to be rated on three task characteristics are shown for the Interior Communications Electrician (IC) rating. At the bottom of the last page of Section F, the following instructions should appear.

<div align="center">

END OF SECTION F
CONTINUE TO NEXT SECTION

</div>

Section G - Miscellaneous Data. The Miscellaneous Data section is a standard section and is included in all NODAC task inventory booklets. The standard instructions for completing Section G on page 28 of the Response Packet are shown in Figure 7-23. Five items pertaining to the useful life of naval uniforms are included in this section. Figure 7-24 shows the standard page containing these five items. At the bottom of the page, the following instructions should appear.

<div align="center">

END OF SECTION G
CONTINUE TO NEXT PAGE

</div>

Final NOTE Page. The final NOTE page of a NODAC task inventory appears on the inside of the back cover of the booklet. It is a standard page which informs the respondent that additional ADD ON sheets and COMMENT sheets are available from the proctor administering the occupational survey. An example of the final NOTE page is shown in Figure 7-25.

Six alternative techniques for possible use in Step 12--Construction of Task Inventory--are described and illustrated in Appendix F. Depending on the nature of the rating being surveyed, one or more of these techniques may be appropriate to try out.

Page 27 of the Response Packet, Section F

This section contains 20 tasks, which are identified by a letter of the alphabet (A-T). Listed under these tasks are three numbered items. These items are numbered to correspond to item numbers in section F of the task inventory booklet.

In those tasks that you perform, estimate under each item the line that pertains to you, and blacken the item number in the response packet in the column for which the corresponding item number appears. If you do not perform the task under A, leave the item number blank and continue to the next task. In making selections, choose only one response under each item.

EXAMPLE: AS A MEMBER OF A 4-12 MAN TEAM, RIG/UNRIG SHORE POWER CABLES, WEIGHING APPROXIMATELY 400 POUNDS. ⟶ Task A in Figure 7-22.

If you, as a member of a 4-12 man team, rig/unrig shore power cables, weighing approximately 400 pounds and the typical frequency of the task is 1-4 TIMES PER MONTH and the demand versus strength is ALTHOUGH DEMANDING, IS STILL WITHIN YOUR CAPABILITIES and the task is difficult to perform ONLY BECAUSE OF THE POUNDS FORCE EXERTED, then you would respond to items 1 through 3 as follows:

In the response packet, blacken 6 under Column 1 – 1-4 TIMES PER MONTH
blacken 3 under Column 2 – ALTHOUGH DEMANDING, IS STILL WITHIN YOUR CAPABILITIES
blacken 4 under Column 3 – ONLY BECAUSE OF THE POUNDS FORCE EXERTED

F. PHYSICAL STANDARDS

Item Number	1	2	3	4	5	6	7	8	9	10	11	12
	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙
	⊘	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙
	⊙	●	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙
	⊙	⊙	●	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙
	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙
	●	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙
	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙

Figure 7-21. Standard Instructions for Completing Section F - Physical Standards of the NODAC Task Inventory Response Packet.

SECTION F. PHYSICAL STANDARDS

A. AS A MEMBER OF A 4-12 MAN TEAM, RIG/UNRIG SHORE POWER CABLES,
WEIGHING APPROXIMATELY 400 POUNDS.

1. TYPICAL FREQUENCY OF ONE/EACH ACTIVITY IN WHICH THE ABOVE FORCE
IS EXERTED:
   1. MORE THAN 50 TIMES A DAY
   2. 13-50 TIMES PER DAY
   3. 6-12 TIMES PER DAY
   4. 1-5 TIMES PER DAY
   5. 1-4 TIMES PER WEEK
   6. 1-4 TIMES PER MONTH
   7. SELDOM

2. DEMAND VERSUS STRENGTH
   1. SO EASY THAT IT REQUIRES PRACTICALLY NO EFFORT AT ALL
   2. REQUIRES SOME EFFORT, BUT STILL QUITE EASILY WITHIN YOUR
       STRENGTH/GRASP
   3. ALTHOUGH DEMANDING, IS STILL WITHIN YOUR CAPABILITIES
   4. PUSHES THE VERY LIMITS OF YOUR CAPABILITIES--YOU ARE BARELY
       ABLE TO MOVE THE OBJECT(S) TO PERFORM THE TASK
   5. SOMETIMES EXCEEDS YOUR STRENGTH CAPABILITIES
   6. USUALLY EXCEEDS YOUR STRENGTH CAPABILITIES

3. THIS TASK IS DIFFICULT TO PERFORM
   1. PARTLY BECAUSE OF THE DIFFICULT GRIP (TO HOLD/MOVE/USE THE TOOL
       OR OBJECT)
   2. PARTLY BECAUSE OF THE CRAMPED RESTRICTED SPACE WHICH RESTRICTS
       BODY LEVERAGE
   3. PARTLY BECAUSE OF THE REACH (TO MOVE/USE/INSTALL THE OBJECT)
   4. ONLY BECAUSE OF THE POUNDS FORCE EXERTED
   5. (NOT DIFFICULT AT ALL, AS YOU INDICATED IN THE PRECEDING
       QUESTION)

Figure 7-22. Partial Example of Section F Items from
the NODAC Interior Communications
Electrician (IC) Task Inventory.

B. AS A MEMBER OF A 2 MAN TEAM, CARRY A MK 23 GYRO COMPASS, WEIGHING
APPROXIMATELY 144 POUNDS, TO/FROM WORK SPACE/SHOP THROUGH
PASSAGEWAYS AND UP/DOWN LADDERS.

4. TYPICAL FREQUENCY OF ONE/EACH ACTIVITY IN WHICH THE ABOVE FORCE
IS EXERTED:
  1. MORE THAN 50 TIMES A DAY
  2. 13-50 TIMES PER DAY
  3. 6-12 TIMES PER DAY
  4. 1-5 TIMES PER DAY
  5. 1-4 TIMES PER WEEK
  6. 1-4 TIMES PER MONTH
  7. SELDOM

5. DEMAND VERSUS STRENGTH
  1. SO EASY THAT IT REQUIRES PRACTICALLY NO EFFORT AT ALL
  2. REQUIRES SOME EFFORT, BUT STILL QUITE EASILY WITHIN YOUR
     STRENGTH/GRASP
  3. ALTHOUGH DEMANDING, IS STILL WITHIN YOUR CAPABILITIES
  4. PUSHES THE VERY LIMITS OF YOUR CAPABILITIES--YOU ARE BARELY
     ABLE TO MOVE THE OBJECT(S) TO PERFORM THE TASK
  5. SOMETIMES EXCEEDS YOUR STRENGTH CAPABILITIES
  6. USUALLY EXCEEDS YOUR STRENGTH CAPABILITIES

6. THIS TASK IS DIFFICULT TO PERFORM
  1. PARTLY BECAUSE OF THE DIFFICULT GRIP (TO HOLD/MOVE/USE THE TOOL
     OR OBJECT)
  2. PARTLY BECAUSE OF THE CRAMPED RESTRICTED SPACE WHICH RESTRICTS
     BODY LEVERAGE
  3. PARTLY BECAUSE OF THE REACH (TO MOVE/USE/INSTALL THE OBJECT)
  4. ONLY BECAUSE OF THE POUNDS FORCE EXERTED
  5. (NOT DIFFICULT AT ALL, AS YOU INDICATED IN THE PRECEDING
     QUESTION)

Figure 7-22. Partial Example of Section F Items from
            the NODAC Interior Communications
            Electrician (IC) Task Inventory (Cont.).

7-36

SECTION G. MISCELLANEOUS DATA

Page 28 of the Response Packet, Section G

The following section is intended to survey your opinion. If your opinion is not
adequately expressed in the choices, leave the appropriate question blank.

The following information is solicited and will be considered in making management
decisions related to Naval uniform items. For the items listed below, select the time
frame which most accurately describes the "useful-life" of that item.

Definition: "Useful-Life" - that period of time elapsed from initial procurement
until repair or replacement is necessary due to deterioration of the fabric or
structure of the garment through normal wear.

For each uniform item, five time frames have been selected. Make a selection
which most accurately reflects your experience with that uniform item.

EXAMPLE:

SECTION G. MISCELLANEOUS DATA

01. WORKING UNIFORM

    1. LESS THAN 3 MONTHS
    2. 3 TO LESS THAN 6 MONTHS
    3. 6 TO LESS THAN 8 MONTHS
    4. 8 TO LESS THAN 12 MONTHS
    5. 12 MONTHS OR MORE

Uniform item 1
in Figure 7-24.

If your experience is that the useful-life of the working uniform is 5 months, you
would mark under item #1 as follows:

G. MISCELLANEOUS DATA

Item Number	1	2	3	4	5	6	7	8	9	10	11	12
	①	①	①	①	①	①	①	①	①	①	①	①
	●	②	②	②	②	②	②	②	②	②	②	②
	③	③	③	③	③	③	③	③	③	③	③	③
	④	④	④	④	④	④	④	④	④	④	④	④
	⑤	⑤	⑤	⑤	⑤	⑤	⑤	⑤	⑤	⑤	⑤	⑤
	⑥	⑥	⑥	⑥	⑥	⑥	⑥	⑥	⑥	⑥	⑥	⑥
	⑦	⑦	⑦	⑦	⑦	⑦	⑦	⑦	⑦	⑦	⑦	⑦

Figure 7-23. Standard Instructions for Completing
Section G - Miscellaneous Data of the
NODAC Task Inventory Response Packet.

RESPOND TO ALL ITEMS. IF ADEQUATELY EXPRESSED

1. WORKING UNIFORM

    1. LESS THAN 3 MONTHS
    2. 3 TO LESS THAN 6 MONTHS
    3. 6 TO LESS THAN 8 MONTHS
    4. 8 TO LESS THAN 12 MONTHS
    5. 12 MONTHS OR MORE

2. DRESS SHOES

    1. LESS THAN 12 MONTHS
    2. 12 TO LESS THAN 18 MONTHS
    3. 18 TO LESS THAN 26 MONTHS
    4. 26 TO LESS THAN 36 MONTHS
    5. 36 MONTHS OR MORE

3. WHITE SHORT-SLEEVED SHIRT

    1. LESS THAN 12 MONTHS
    2. 12 TO LESS THAN 18 MONTHS
    3. 18 TO LESS THAN 26 MONTHS
    4. 26 TO LESS THAN 36 MONTHS
    5. 36 MONTHS OR MORE

4. SERVICE DRESS BLUE JACKET

    1. LESS THAN 24 MONTHS
    2. 24 TO LESS THAN 36 MONTHS
    3. 36 TO LESS THAN 42 MONTHS
    4. 42 TO LESS THAN 60 MONTHS
    5. 60 MONTHS OR MORE

5. DARK BLUE DRESS TROUSERS (SKIRTS FOR WOMEN)

    1. LESS THAN 12 MONTHS
    2. 12 TO LESS THAN 24 MONTHS
    3. 24 TO LESS THAN 30 MONTHS
    4. 30 TO LESS THAN 48 MONTHS
    5. 48 MONTHS OR MORE

END OF SECTION G
CONTINUE TO NEXT PAGE

Figure 7-24. Standard Items Included in Section G
of a NODAC Task Inventory.

NOTE

YOUR PROCTOR HAS COMMENT SHEETS AVAILABLE FOR YOU TO PROVIDE COMMENTS ON SPECIFIC PROBLEMS AND/OR SUGGESTIONS CONCERNING YOUR RATING THAT YOU BELIEVE WOULD BE HELPFUL FOR ANALYSIS. YOUR COMMENTS SHOULD ADDRESS IMPROVEMENT TO THE RATING, THE TRAINING PROCESS, AND CAREER OPPORTUNITIES WITHIN YOUR RATING.

INSERT THE ADD-ON AND COMMENT SHEETS INTO YOUR RESPONSE PACKET.

THIS CONCLUDES YOUR PART IN THE INVENTORY. TURN IN ALL MATERIALS TO THE PROCTOR. THANK YOU FOR YOUR COOPERATION AND CONTRIBUTION TO THE NAVY OCCUPATIONAL TASK ANALYSIS PROGRAM.

Figure 7-25. Example of the Standard Final NOTE Page
in a NODAC Task Inventory Booklet.

Step 13 - Review by Local SME in Rating, and Revision

The sections of the task inventory booklet finalized in Step 12 are given a preliminary review in Step 13 by a NODAC subject matter expert (SME) in the rating if one is on board. Otherwise, an SME in the rating is contacted in the Washington, DC area and asked to review the contents of the inventory booklet. The SME is likely to catch oversights in coverage of the work of the rating, and may suggest better ways of phrasing some of the task statements to make them more clearly understandable to job incumbents. Based on this review, the sections of the inventory affected are revised to incorporate the useful suggestions made by the SME.

Step 14 - NODAC Code 21 "Murder Board" Review, and Revision

The purpose of the "Murder Board" is to review the task inventory booklet for content and completeness prior to in/out of house review. In preparation for the Murder Board review by Code 21 personnel, five copies of all sections of the inventory booklet are reproduced, including the instruction sheets for appropriate sections of the inventory. Also prepared is a list of duty categories that indicates which task statements are included in each duty category.

The five members of the Murder Board consist of one representative each from Code 21 (Director, Data Collection Division), Code 211 (Head, Task Inventory Development and Occupational Survey Branches), and Code 211A (Supervisor, Task Inventory Development Branch), plus one Code 21 task inventory developer not associated with the development of the booklet. Only the project manager of the task inventory development team attends the Murder Board review. The Murder Board is convened at the request of Code 21, usually in conference with the project manager. Members are notified when the board will meet (normally the Wednesday after task inventory construction is completed). Each member is provided with a copy of the inventory booklet and duty category list.

A Murder Board review may take as little as two hours or as long as four hours, depending on how diversified the work of the rating is and how well the task inventory development team has done its job. During the Murder Board, any necessary changes to the task inventory booklet are agreed upon and recorded on the project manager's copy. All changes are made using the word processing equipment, and the revised task inventory booklet is then ready for in/out of house review.

Step 15 - In/Out of House Review

Four divisions of NODAC and a number of out-of-house commands are given the opportunity to provide a technical review of the task inventory booklet. The four-NODAC divisions reviewing the inventory are provided a task inventory booklet with duty categories identified. These divisions are the following:

- Code 211 - Head, Task Inventory Development and
      Occupational Survey Branches

- Code 22 - Director, Applications and ADP Division

- Code 23 - Director, Analysis Division

- Code 31 - Director, Occupational Standards Division

The out-of-house commands reviewing the booklet are as follows:

- Primary Adviser(s) - 1 copy each

- Technical Adviser(s) - 1 copy each

- CNET (N-9) - 2 copies

- CNTT (016) - 2 copies

- CO NAVEDTRAPRODEVCEN - 2-copies

- CNO (OP-13) - 1 copy

- ECM (OP-132) - 1 copy

NODAC's primary advisers are the Navy warfare commands (Submarine, Surface, and Air), Logistics, Medicine, and Intelligence. Technical advisers are the Sea Systems, Air Systems, and the Supply Systems commands. The particular commands asked to review the booklet depend on the nature of the rating being surveyed.

The cover of the task inventory booklet is constructed from a preprinted standard cover located in the TID Master File. Three types of information are inserted on the standard cover page to identify the rating under review (insignia, name, and abbreviation). Photocopies of all sections of the inventory then are assembled into review booklets.

A covering memo is prepared for the booklets being distributed for review within NODAC. The standard format of this covering memo is shown in Figure 7-26, with appropriate insertions to be placed in the blanks. The memo is typed and submitted for review up the chain of command to Code 21 for signature. When signed, four copies of the signed memo are photocopied. The original memo is returned by the project manager and filed in the project summary file. The final draft of the task inventory booklet, along with a copy of the covering memo then is distributed to the four NODAC reviewers.

A covering letter is also prepared for the booklets being distributed for review outside of NODAC. The standard format of this covering letter is shown in Figure 7-27, with appropriate insertions to be placed in the blanks. The draft letter is reviewed up the Code 21 chain of command and then typed. Code 21 reviews it once more and forwards it to Code 2 for review and to Code 1 for signature. Code 11 serializes the master copy of the covering letter. Sufficient copies of the signed, serialized covering letter to be sent to out-of-house reviewers then are photocopied.

Packages consisting of the covering letter, final draft of the task inventory booklet, and a blank Response Packet are assembled for mailing to each of the out-of-house reviewers. Correct addresses are obtained from the Standard Navy Distribution List in Code 11, and large mailing envelopes are addressed and mailed by first class mail.

Step 16 - Revision, Final NODAC Review, and Printing Guides

The responses from the internal NODAC review and the review by out-of-house commands are accumulated as they are received. No changes are made to the final draft of the task inventory booklet until the deadline for responding has been reached or all responses have been received, whichever comes first. The task inventory development team project manager then examines the changes recommended by the reviewers and decides which recommended changes should be made. For any recommended change that is not made, the project manager must provide the reason why that change should not be made. The reason is written adjacent to the recommended change.

The project manager then submits the revised final draft of the task inventory booklet, with all reviewer recommended changes attached, to the Supervisor of the Task Inventory Development Branch (Code 211A). Code 211A reviews the revised booklet and attachments, and writes any recommended further changes or other pertinent comments on the bottom half of the Task Inventory Routing Sheet (see Figure 7-28).

Code 211A then submits the revised final draft booklet, the attachments, and the Task Inventory Routing Sheet to the Head of the Task Inventory Development and Occupational Survey Branches (Code 211) who follows the same review procedure as that followed by the project manager, recording any further changes or comments on the Task Inventory Routing Sheet. The routing is signed off as each reviewer completes the review. Code 211 then submits the package to the Director of the Data Collection Division (Code 21).

DEPARTMENT OF THE NAVY
NAVY OCCUPATIONAL DEVELOPMENT AND ANALYSIS CENTER (NODAC)
BUILDING 150, WASHINGTON NAVY YARD (ANACOSTIA)
WASHINGTON, D.C. 20374

_____ (Date)

MEMORANDUM

From: Code 21
To: Code 22
         Code 23
         Code 31

Subj: Review draft of Task Inventory Booklet for the
       _____ rating; forwarding of

Encl: (1) Review draft of Task Inventory Booklet for the
           _____ rating

1. Enclosure (1) is forwarded for review and comment prior to printing.
It is a preliminary draft and is being reviewed by the Primary Adviser,
Technical Adviser, and Rating and Warfare Sponsors.

2. _____ is the project manager (Code 21) and is available
to provide assistance or information.

3. In order to expedite printing and administration of subject booklet, it
is requested that your comments by submitted to Code 21 with copy to project
manager no later than _____.

_____
(Code 21 Signature)

Figure 7-26.   Standard Covering Memo for Internal NODAC
               Review of Inventory Booklet Final Draft.

DEPARTMENT OF THE NAVY
NAVY OCCUPATIONAL DEVELOPMENT AND ANALYSIS CENTER (NODAC)
BUILDING 150, WASHINGTON NAVY YARD (ANACOSTIA)
WASHINGTON, D.C. 20374

NODAC:21/wmw
3900
Ser

From: Officer-In-Charge
To: Distribution List

Subj: Technical Review of the   Rating Task Inventory Booklet

Ref: (a) BUPERSMAN 1450100

Encl: (1) Review Draft of   Rating Task Inventory Booklet
      (2) Sample response packet

1. Pursuant to reference (a), NODAC is the activity responsible for collecting, analyzing, and maintaining the Occupational Data Bank for the Navy Occupational Task Analysis Program (NOTAP) for all Navy ratings. NODAC is 'eveloping a Navy-Wide occupational inventory of the   rating. This inventory is not a duplication of current work studies, manpower validations, or other personnel programs. Rather it is the initial step in a comprehensive analysis of the   rating directed toward pinpointing definite work/job requirements as related to equipment, working conditions, and duty location. This data will be used by COMNAVMILPERSCOM, CNET, Rating Sponsors, and in the development of Occupational Standards.

2. To accomplish the above objective, an inventory of occupational data for the   rating has been constructed based on the observation and interview of personnel in paygrades E-3 through E-9 in the rating, and the most recent Occupational Standards. The inventory is currently in the review process. To ensure a comprehensive review by knowledgeable personnel in the   community the assistance of your staff is requested. The assistance required will be limited to technical advice relative to the contents of enclosure (1).

3. Enclosure (2) is used to record the responses to the Task Inventory Booklet when it is administered, and is provided to you for information purposes only.

4. NODAC point of contact for questions related to this draft inventory is   who can be reached via Autovon 288-4631/32 or commercial 202-433-4631/32.

5. CNTECHTRA and CO, NAVEDTRAPRODEVCEN are requested to forward comments to CNET (Code N922) for consolidation. Other distribution list addresses are requested to provide comments to NODAC. Concurrence will be assumed if comments are not received by   . Negative responses are not required.

Figure 7-27. Standard Covering Letter for Out-of-House
Review of Inventory Booklet Final Draft.

Subj: Technical Review of the   Rating Task Inventory

6. Your assistance is appreciated.

Distribution:
CNO (OP-03, OP-13)
COMNAVSEASYSCOM
CNET (N-9) (2)
CNTT (016) (2)
CO, NAVEDTRAPRODEVCEN (2)

Copy To: (w/o encl)
NMPC-5

Figure 7-27. Standard Covering Letter for Out-of-House
Review of Inventory Booklet Final Draft (Cont.).

PROJECT NAME   PROJECT MANAGER

ROUGH (IN/OUT HOUSE REVIEW COMPLETED)	IN	OUT	PRINTER'S LONG EDITS	IN	OUT
			PROJ MGR		
211A					
211			211A		
21			211		
			21		
ADMIN (11)			02		
			01		
			ADMIN		
			PROJ MGR		

PAGE	ITEM	COMMENTS

Figure 7-28. Task Inventory Routing Sheet
for Final NODAC Review.

Code 21 also reviews the revised final draft booklet and all attachments and comment sheets, coordinates any required additional changes with the project manager, and submits the revised final draft booklet to the Technical Director of NODAC (Code 2) for review and comment. Any additional changes resulting from Code 2 review are coordinated with the project manager.

During the NODAC final review process, correction of spelling errors and any other very obvious errors are made in the final draft booklet by the reviewer at the time of discovery. Any other recommendations for change (content, order of items, etc.) are added to the Task Inventory Routing Sheet ONLY. The routing sheet/comments are returned to Code 211A for filing in the project summary file.

Finally, the project manager delivers the revised final draft booklet to Code 11 for transfer onto printing guides (Printer's Long Edits). When the preparation of the booklet is completed, Code 11 returns both the revised final draft booklet and the copy prepared on printing guides to the project manager for proofing. At this time, the month and year that the survey will be administered are added to the cover page.

Step 17 - Final Proof, Corrections, Printing Request, and Printing

The project manager and one other member of the task inventory development team proofread the copy of the inventory booklet from the printing guides against the revised final draft booklet. Any typographical errors they find are identified on a piece of paper clipped to the printing guide near where the mistake was made.

The proofread booklet on printing guides, with typographical errors flagged, then is submitted up the chain of command for review. The project manager delivers the package to Code 211A for review and submission (via Code 211) to Code 21. When the Code 21 review is completed, the package is returned to Code 11 for correction of typographical errors. Code 11 performs the necessary corrections and returns the corrected copy of the inventory booklet on printing guides to Code 211A. A check is made that the corrections were properly made, and then the package is routed to Code 1 (via Code 2) for signature of the covering letter in the front material of the booklet. After signing the covering letter, Code 1 sends the booklet to Code 11 to be serialized and dated, after which Code 11 returns the booklet to the project manager.

The project manager makes three photo-reduced (by 20%) copies of the booklet from the printing guides. A copy with duty categories attached is delivered to the Applications and ADP Division (Code 22). The second copy is placed in the project summary file. The third copy is retained by Code 211A until the inventory booklet is printed and available for reference.

The project manager then fills out the DD Form 283 Defense Printing Service Requisition (see Figure 7-29) and the publications running sheets according to the printing request procedures detailed in the printing request folder located in Code 21. The printing request is signed by Code 21, and one copy of the request and publications running sheets are retained by Code 21 for filing.

The final printing guides along with four copies of the printing request and the publications running sheets then are delivered to Publications and Printing at the following location.

> Publications and Printing
> Pers-109/NMPC-012X
> RM 1721, Navy Annex
> Washington, DC

Step 18 - Complete Project Summary File

The various components of the audit trail that should be filed in the project summary file are as follows, more or less in the order of their addition.

- MAPMIS 1221-4000 UR
- Development plan
- Previous task inventory booklet
- Agenda and notes of the O&I predeployment meeting
- O&I trip itinerary for all team members (master)
- Post O&I trip report
- New task inventory booklet
- All pertinent letters/messages/memos
- Task inventory routing sheet

When the new booklet is sent to the printer at the completion of Step 17, the task inventory development team project manager takes an inventory of the project summary file to make certain that all of the required information is included. The complete file then is delivered to the Supervisor, Occupational Survey Branch (Code 211B). At this point, responsibility for maintaining the project summary file rests with the Occupational Survey Branch as the task inventory is being administered during Stage 2 of the NODAC occupational survey and analysis process.

NOTE: NO CARBON PAPER NECESSARY

Each sheet of this special test form has been chemically treated to make the required number of copies without inserting carbon paper

.DEFENSE PRINTING SERVICE REQUISITION - SHORT FORM		ORIGINATOR: Submit 4 copies of each request to your Publications Liaison office.	
From (Installation, Bureau and Office)		Classification	
Deliver to (Bldg. and room no.) (Phone)		REQUISITION NUMBER	JOB NUMBER
REQUESTING OFFICE APPROVAL	LIAISON OFFICE APPROVAL	DATE OF REQUEST	DATE JOB REQUIRED
TITLE AND PUBLICATION/FORM NO.		APPROPRIATION CHARGEABLE	

CUSTOMER	FOR PLANT USE ONLY

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☐ BLUEPRINT   ☐ MICROFILM   ☐ PHOTOSTAT   NEG.   POS.

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MARGINS			PUNCH			Position of Holes
TOP	OUT SIDE	BIND	NO. HOLES	SIZE	Inches	
					C to C	

ADDITIONAL INSTRUCTIONS

	TOTAL COST
DATE IN	DATE OUT

DD FORM 283

Figure 7-29. DD Form 283 Defense Printing Service Requisition.

HANDBOOK FOR CONSTRUCTION OF TASK INVENTORIES

FOR NAVY ENLISTED RATINGS

ANNOTATED BIBLIOGRAPHY

OF INFORMATION SOURCES

C

BIBLIO-0

ANNOTATED BIBLIOGRAPHY

Ammerman, H. L., & Pratzner, F. C. Performance content for job training
(R&D Series No. 121-125, Vols. 1-5). Columbus, OH: The Ohio State
University, The Center for Vocational Education, March 1977.

This 5-volume set presents an extremely readable description of procedures
for constructing task inventories, surveying the task performance of occupa-
tions, and analyzing survey data to aid curriculum planners and developers in
determining the appropriate performance content for job training. The pro-
cedures are intended to be of value to both occupational curriculum personnel
and those persons concerned with noncurriculum issues of occupational descrip-
tion and updating of job content information.

Ash, R. A., & Edgell, S. L. A note on the readability of the Position
Analysis Questionnaire (PAQ). Journal of Applied Psychology, 1975,
60(6), 765-766.

The Position Analysis Questionnaire (PAQ) is a structured job analysis
questionnaire composed of worker-oriented job elements. Four readability
indexes--the Dale-Chall, the Flesch, the FOG, and the SMOG--were applied to
both the directions and questions of the PAQ. The PAQ directions reach a
college readability level using the Flesch and SMOG indexes and reach the
college graduate level using the Dale-Chall and FOG indexes. The PAQ ques-
tions reach the college graduate readability level on all four indexes.
Implications regarding the use of the PAQ in light of its difficult level of
readability are discussed. The authors conclude that if the PAQ is to gain
wider usage as a principal job analysis technique used by personnel practi-
tioners, then serious consideration should be given to appropriate revision
of the instrument so that it can be understandably read by a much larger
segment of the population.

The bluejackets' manual (20th ed.). Annapolis, MD: United States Naval
Institute, 1978.

The bluejackets' manual has historically contained a concise wealth of
information about the many diversified tasks required of sailors in the
United States Navy. This 20th edition continues the tradition with a "back
to basics" manual that covers a wide spectrum of subjects of interest to Navy
men and women, from recruit to admiral, throughout their naval service. Of
particular interest is the addition of an extensive bibliography (Appendix J)
which offers additional references, both official and unofficial, on hundreds
of subjects.

Booher, H. R. Job performance aids: Research and technology state-of-
the-art (NPRDC TR 78-26). San Diego, CA: Navy Personnel Research and
Development Center, July, 1978.

This report describes and compares the various Job Performance Aid tech-
niques and identifies and categorizes factors important to selection, design,
cost-performance trade-off, conduct of future research, and implementation of
performance aiding technology. More than 100 surveyed JPA systems and tech-
niques are classified under five categories: (1) format/content, (2) display
media, (3) applied training, (4) peripheral test/diagnostic, and (5) delivery
systems. Major factors are identified as critical to the development of a
JPA algorithm, including personnel aptitude and experience, type and complex-
ity of task, type and complexity of equipment, and degree of proceduralization
required. A conceptual model is presented for use by the JPA community in
cost trade-off analyses, in JPA selection algorithms, and in the grouping of
theoretical trends. The report also presents a theoretical base for use of
memory in JPA; previews a theory for mixing JPA techniques, principles, and
methodologies; and outlines goals for future JPA research and technology
efforts.

Callahan, M. D., & Rosenthal, N. L. Dialogue - What's NOTAP all about?
Campus, January 1977, 11, 20-23 (published by the Chief of Naval Education
and Training, Naval Air Station Pensacola, FL).

This article presents a brief history of the Navy Occupational Task Analy-
sis Program (NOTAP) since its early conception in the mid-1960's. Also
discussed are the data collected by NOTAP and the method of data collection—
by a job task inventory questionnaire. Respondents are billet incumbents
(job holders). Data collected are processed by the Comprehensive Occupa-
tional Data Analysis Programs (CODAP) which were developed under the auspices
of the United States Air Force Human Resources Laboratory. Various uses of
NOTAP data are described.

Chambers, A. N. Development of a taxonomy of human performance: A heuristic
model for the development of classification systems (Tech. Rep. No. 4).
Silver Spring, MD: American Institutes for Research, March 1969. (NTIS
No. AD-688 605)

This report presents a heuristic model for analysis of the issues involved
in the classification of human performance. The "why," "what," and "how" of
classification are discussed in turn. An extensive appendix presents provi-
sional classifications of human performance descriptors including human
responses, performance capabilities, operations, equipment and materials,
personnel, physical environments, social environments, selection, training,
human physical moderators/mediators, physiological moderators, and psycho-
logical moderators/mediators.

Christal, R. E., & Weissmuller, J. J. New CODAP programs for analyzing
task factor information (AFHRL-TR-76-3). Brooks Air Force Base, TX:
Air Force Human Resources Laboratory, May 1976.

The Comprehensive Occupational Data Analysis Programs (CODAP) package is a
highly interactive and efficient system of computer routines for analyzing,
organizing, and reporting occupational information. Previously, CODAP con-
tained approximately 35 main programs for analyzing data collected with job
inventories to produce task-level descriptions of the work performed by indi-
viduals and groups of individuals. It also contained programs for identi-
fying and describing the types of jobs existing in an occupational category,
and for describing the characteristics of individuals falling into special or
job-type groups. Eight new programs described in this paper represent a
major addition to the CODAP system, filling an important gap by equipping the
analyst with tools for analyzing and manipulating information describing work
tasks rather than jobs or persons. In addition to describing the eight new
programs in detail and showing how they interact with existing programs, the
paper provides an example demonstrating how the new programs can be used to
develop and apply an equation which assigns training priorities to tasks in
an occupational area based on consideration of relevant task factor infor-
mation.

CODAP System 80 user's manual. Washington, DC: DoD Executive Agent for
Joint Task Analysis Support, in preparation.

This user's manual documents the new CODAP System 80 being prepared for use
on IBM computers. Development of this new CODAP software was sponsored by
the DoD Executive Agent for Joint Task Analysis Support because of limita-
tions in the existing IBM CODAP system that the United States Navy, Marine
Corps, and Coast Guard have been using. The new system has more analytical
power and flexibility, a more user-oriented display capability, and enhanced
transportability to other DoD agencies. The new system can accommodate any
rating scale, not just relative time spent. In addition, the maximum number
of items that can be included in a job task inventory has been increased from
2000 to 5000.

Cunningham, J. W., Tuttle, T. C., Floyd, J. R., & Bates, J. A. The develop-
ment of the Occupation Analysis Inventory: An "ergometric" approach to an
educational problem (Center Research Monograph No. 6). Raleigh, NC: North
Carolina State University at Raleigh, Center for Occupational Education,
1971.

This paper describes the development of an Occupation Analysis Inventory
(OAI) to satisfy the need for a comprehensive taxonomy of human work and
accompanying measurement devices and procedures suitable for educational
purposes. Such a taxonomic system should be organized into a hierarchical

structure ranging from occupational categories (clusters) and descriptors to task categories and descriptors, thus providing analytical capability at different levels of complexity. "Ergometrics" is defined as the application of psychometric principles and procedures to the study of human work. The development of the OAI is conceived as the first phase in an ergometric R&D program directed toward the problem of articulation between the educational and work domains.

DeVries, P. B., Jr., Eschenbrenner, A. J., Jr., & Ruck, H. W. Task analysis handbook (AFHRL-TR-79-45[II]). Brooks Air Force Base, TX: Air Force Human Resources Laboratory, July 1980.

This handbook provides a validated set of procedures and guidelines for analyzing tasks into subtasks and into supporting skills and knowledges. The handbook is designed for use in technical training by subject matter experts. It assumes that tasks have already been selected for training, that trainee proficiency levels have been determined, and that the trainee population is known. Three major stages of the task analysis procedure are contained in the handbook: (1) development of preliminary performance requirements, (2) identification of subtasks, and (3) identification of supporting skills and knowledges.

Driskill, W. E., & Gentner, F. C. Four fundamental criteria for describing the tasks of an occupational specialty. In Papers presented at the 20th Annual Conference, Military Testing Association. Randolph Air Force Base, TX: USAF Occupational Measurement Center, TN 78-04, December 1978.

As occupational analysis becomes more sophisticated, the length of occupational survey task inventories has become longer. The added length results from impetus to meet the following objectives: to describe tasks at the lowest level of work activities that describes a complete and inseparable operation, to provide technical training schools with the most useful data to structure their courses, and to best describe career field structure to classification interests by multi- or cross-ladder surveys. Longer surveys make critical four fundamental criteria for describing occupational survey tasks. These criteria are (1) each task must be time-ratable, (2) each task must communicate in the language of the specialty, (3) each task must be mutually exclusive of other tasks in the inventory, and (4) each task must differentiate among workers where actual task performance differs. Compromise between these criteria is often necessary in the practical world. The appropriate level of detail is determined by carefully balancing criteria 3 and 4. Setting the level of detail at the appropriate point maximizes the information to be gained from task inventories and minimizes the length to provide accurate data to users of the occupational survey program.

Duffy, T. M.   Readability applications in the Armed Forces.   San Diego,
   CA: Navy Personnel Research and Development Center.   Technical Report
   in press.

   This report is one in a series examining reading requirements, reading
   skill levels, and the effects of a mismatch of skill and requirements on
   school and job performance in the United States Navy. It describes the
   limitations in the use of readability formulas, and proposes alternative
   approaches to (1) determining the comprehension requirements of existing Navy
   text, and (2) ensuring that writers attend to comprehension requirements in
   producing new text.

Duffy, T. M., Carter, J. D., Fletcher, J. D., & Aiken, E. G.   Language
   skills: A prospectus for the naval service (NPRDC Special Report 76-3).
   San Diego, CA: Navy Personnel Research and Development Center, October
   1975.

   Widespread concern has been voiced over an apparent mismatch between the
   reading ability of naval personnel and the reading requirements they encoun-
   ter in a naval career. Since reading is a skill prerequisite to all naval
   careers, a mismatch of skills and requirements could have widespread conse-
   quences for fleet effectiveness. This report provides a review of the area,
   with suggestions for an R&D program as well as management actions which would
   help reduce the problem of matching skill and requirements. While the focus
   of the R&D recommendations is on the naval service, many of the recommendations
   should be applicable to a variety of settings.

Duffy, T. M., & Kabance, P.   Testing the readable writing approach to text
   revision. San Diego, CA: Navy Personnel Research and Development Center.
   Technical Report in press.

   This report is one in a series examining reading requirements, reading
   skill levels, and the effects of a mismatch of skill and requirements on
   school and job performance in the United States Navy. The purpose of this
   research was to determine the extent to which increasing readability by
   carrying out readable writing revisions will improve comprehension. In a
   series of five experiments, the results indicated that readable writing
   revisions can facilitate comprehension under very particular circumstances.
   However, the resulting changes in the readability score are not, in any way,
   predictive of the changes in comprehension. Thus, the authors conclude that
   a formula score is neither a good guideline nor a good criterion for pro-
   ducing comprehensible text. Further, they recommend that reference to a
   readability formula as a means of controlling comprehension should be deleted
   from all Navy procurement specifications and internal writing control docu-
   ments.

Duffy, T. M., & Nugent, W. A. Reading skill levels in the Navy (NPRDC TR 78-19). San Diego, CA: Navy Personnel Research and Development Center, April 1978.

The purpose of this research was to provide descriptive information on reading skill levels in the United States Navy that can be used when making decisions concerning implementation of any of the various options for minimizing functional illiteracy. A standard reading test (the vocabulary and comprehension subtests of the Gates-MacGinite Reading Test, Survey D) was administered to all recruits (approximately 31,500) entering the Recruit Training Command, San Diego over a 1-year period (13 May 1974 to 30 May 1975). A significant proportion of the sample was found to have reading skills well below the difficulty of the manuals used in training. Reading skills were examined in relationship to rating assignments, the difficulty of rate training manuals, race, education, and Basic Test Battery (BTB) scores.

Eschenbrenner, A. J., Jr., DeVries, P. B., Jr., Miller, J. T., & Ruck, H. W. Methods for collecting and analyzing task analysis data (AFHRL-TR-79-45[I]). Brooks Air Force Base, TX: Air Force Human Resources Laboratory, July 1980.

Task analysis, a critical front-end activity in the instructional systems development methodology, is the process of partitioning job tasks into their component subtasks and identifying the skills and knowledges required to support task performance. Implementation of a standardized procedure in the United States Air Force for identifying essential subtasks and supporting skills and knowledges was expected to hold considerable potential for increasing training efficiency and reducing training costs. A simplified task analysis procedure and documentation system was specified, and a task analysis handbook (AFHRL-TR-79-45[II]) was prepared.

Executive summary for CODAP System 80. Washington, DC: DoD Executive Agent for Joint Task Analysis Support, in preparation.

This executive summary for the new CODAP System 80, being prepared for use on IBM computers, provides an overview of occupational analysis in the military, use of the existing IBM CODAP system, current limitations of the existing system, and capability of the new system to overcome these limitations.

Foley, J. P., Jr. Occupational analysis technology: Expanded role in development of cost-effective maintenance systems (AFHRL-TR-80-39). Brooks Air Force Base, TX: Air Force Human Resources Laboratory, November 1980.

The objective of this study was to refine and coordinate occupational analysis, job performance aids (JPAs), and elements of the instructional systems development (ISD) process for task-specific maintenance training.

A comparative analysis of Task Identification and Analysis (TI&A) and current occupational analysis technologies indicates substantial incompatibilities between them. The Task Identification Matrix (TIM) of the TI&A technology identifies specific tasks for each specific hardware to which it is applied. In contrast, although using similar maintenance functions, the occupational analysis technology identifies sets of heterogeneous maintenance tasks across an Air Force Specialty Code (AFSC) without regard to the specific hardware in the AFSC; this hardware is frequently of varying vintages of design. By neglecting the real differences among tasks within the same set, from hardware to hardware, current occupational analysis results in oversimplified and distorted portrayals of job content of many maintenance AFSCs. Proposals are made for expanding the capability of the technology by gathering information on hardware-specific bases, which makes possible the reporting of results in terms of hardware-specific sets of tasks. Proposals are also made for gathering and displaying data concerning activities which normally are common elements of many maintenance tasks such as the use of test equipment and hand tools.

Gael, S. Development of job task inventories and their use in job analysis research. New York, NY: American Telephone & Telegraph Company, 1975.

An approach to developing job task inventory questionnaires by interviewing supervisors or job incumbents is described. An initial interview provides the bulk of the information from which task statements are extracted. A verification interview is conducted with a different interviewee. A follow-up interview is conducted with the previous interviewees to review and modify a draft of the job inventory questionnaire. Applications of job task inventory questionnaires in studies of engineering, sales, and clerical jobs within American Telephone & Telegraph are described, and summaries of study results are presented.

Gambardella, J. J. N., & Alvord, W. G. TI-CODAP: A computerized method of job analysis for personnel management. Prince George's County, MD, October 1979.

For personnelists and mangers of human resources in both the public and private sectors, this manual offers a systematized and data-based approach for constructing an integrated personnel system. The job analysis methods employed in these procedures embody a combination of desirable features developed by the United States Air Force and other traditional methods, although the procedures rely almost entirely on the occupational survey methods and Comprehensive Occupational Data Analysis Programs (CODAP) developed by the U.S. Air Force. Included in the manual are detailed steps for constructing, administering, and analyzing employee responses to a task inventory; and an explanation of principal CODAP programs and their applications toward the integration of CODAP as part of a comprehensive personnel management system.

Glossary of ITRO education and training terminology. Interservice Training
    Review Organization, in preparation.

    This glossary will be the official source for interservice educational and
training terminology. It will include abbreviations/acronyms, terms, and
their definitions.

Backman, J. R. Toward understanding the role of tasks in behavioral
    research. Acta Psychologica, 1969, 31, 97-128.

    This paper attempts to lay the ground work for furthering our understanding
of the differences among tasks and the ways in which tasks influence behavior.
Three general 'problem areas' are reviewed and evaluated: (1) problems in
defining the concept 'task'—i.e., what are the components and characteris-
tics of an adequate task definition; (2) problems relevant to the description
of tasks—i.e., what are the most useful and appropriate bases for making
task descriptions and comparisons; and (3) problems relevant to understanding
task effects—i.e., how do task factors make differences in the ways people
think and act.

    After evaluating several issues relevant to the problems of task definition
and description, one working definition of the concept is proposed, and one
general approach to task description is suggested as likely to be most useful
in understanding the behavioral impact of tasks. Finally, a framework is
proposed which outlines the diversity of effects that may be attributable to
task factors in a performance situation, and suggests how these effects may
be conceptualized and related.

Hanson, P. J. Introduction to Marine Corps task analysis: Training
    Manual II (Tech. Rep. No. 10). Los Angeles, CA: California State
    University, Los Angeles, March 1976.

    This training manual is designed to aid in the orientation of personnel
newly assigned to the Office of Manpower Utilization (OMU), Headquarters,
United States Marine Corps. It provides a brief overview of Marine Corps
task analysis (TA) as it is conducted by OMU. Basic steps in the TA process
are (1) construct a task inventory; (2) administer self-report inventory;
(3) analyze, using CODAP; (4) recommend solutions to identified problems; and
(5) secure approval of recommendations. The manual gives a brief description
of each step. OMU's major goal of improving the utilization of human re-
sources in the Marine Corps is discussed, and the way that the staff is
organized to accomplish this goal is presented. Appendices provide brief
descriptions of task analysis terms and a synopsis of the Comprehensive
Occupational Data Analysis Programs (CODAP) used to define jobs in an occu-
pational field.

Honour, W. H., & Kossen, R. L. WASH-MIC. McLean, VA: Rany Co., 1974.
(LC 74-155735)

This publication is an alphabetical compendium, in dictionary format, of
acronyms and abbreviations in common usage in the Washington, DC - Military
Industrial Complex, the Washington scene of action, and throughout the world
where United States forces and supporting industry are located. Definitions
are included. Unfortunately, this valuable reference is out of print.

Instructional program development training task analysis procedures [Draft]
(Supplement No. 2 to NAVEDTRA 106A). Pensacola, FL: Chief of Naval
Education and Training, 24 January 1978.

The purpose of this manual is to set forth workable procedures as experi-
enced by the Career Task Analysis Department of the Naval Education and
Training Support Center, Pacific. The procedures set forth have been found
to be effective and efficient methods for assembling job data and interpret-
ing, refining, expanding upon, and otherwise processing this information to
produce complete and reliable job task listings as the basis for instructional
system design. These procedures are intended to supplement and amplify
Interservice procedures for instructional systems development - Phase I:
Analyze (NAVEDTRA 106A).

Instructional system design (Air Force Manual 50-2). Washington, DC:
Department of the Air Force, July 1975 and May 1979.

This manual serves as the guide for applying the United States Air Force
systems approach to the development of education and training programs. It
presents a technology of instructional design and a model for developing
cost-effective instructional systems. This manual applies to all education
and training personnel who plan, develop, approve, administer, or manage Air
Force instruction and its supporting materials.

Interservice procedures for instructional systems development - Phase I:
Analyze (NAVEDTRA 106A), 1 August 1975.

This manual is the first in a series detailing interservice procedures for
instructional systems development (ISD). The first step in the ISD process
is to establish exactly what constitutes, or will constitute, adequate on-
the-job performance. The "analyze" phase answers the questions of what
tasks, performed in what manner, under what conditions, in response to what
cues, to what standards of performance, make up the job. The ultimate pur-
pose of ISD is to produce a properly trained person, that is, a person who
can do the job for which he or she was trained.

Job analysis: Developing and documenting data (BIPP 152-35). Washington, DC: United States Civil Service Commission, Bureau of Intergovernmental Personnel Programs, December 1973.

This publication provides guidance in developing job information through job analysis for use by State and local governments. It is written primarily for personnel technicians who have some familiarity with job analysis. Guidelines are given for preparing for and conducting the job analysis, and examples of how the job analysis can be used are included. Some job analysis terms are defined, and techniques for gathering job analysis data are presented in an appendix.

Job and task analysis course (Vols. 1-8). Fort Monroe, VA: United States Army Training Developments Institute, August 1979.

This course provides an introduction to job and task analysis which focuses on basic skills necessary to United States Army TRADOC analysts. The job training package is primarily designed for the novice or apprentice analyst. However, it also serves as a useful training tool and refresher for analysts with some degree of experience. In addition, it provides a quick introduction for newly assigned managers in analysis and training design/development activities, and for personnel assigned as evaluators to acquaint them with the Job and Task Analysis process.

The course is designed around five subject areas encompassing 27 training modules: basic analysis skills (e.g., identifying tasks, basic interviewing), basic researching skills required to develop a task inventory, selecting tasks for training, techniques for analyzing tasks and recording task performance, and management of analysis. As the self-paced student completes each training module, he or she moves on to a criterion test followed by feedback regarding performance on the test.

Job and task analysis handbook (TRADOC PAM 351-4[T]). Fort Monroe, VA: HQ, United States Army Training and Doctrine Command, August 1979.

This Job and Task Analysis Handbook provides the procedural guidance for the analysis phase of Instructional Systems Development (ISD) and serves as a ready reference in day-to-day analysis activities. The organization of the handbook aids in understanding the job and task analysis process and describes the steps necessary during the analysis phase. The data collected during front-end analysis (defined here as job and task analysis) is regarded as valuable in its application to the United States Army training development process. This pamphlet is an aid to the novice analyst, but assumes that he or she has completed the corresponding job training package. Understanding of the process and competence in the variety of job and task analysis skills will come with time and effort. This handbook aids that understanding, but still requires time and experience on the job as an analyst.

Job performance aid: Job and task analysis (TRADOC PAM 351-6). Fort
   Monroe, VA: HQ, United States Army Training and Doctrine Command,
   October 1980.

   This document is a job performance aid (JPA) for conducting United States
Army job and task analyses. The bulk of the information in the aid is con-
densed or summarized from the Job and task analysis handbook (TRADOC PAM
351-4), the Job and task analysis course, and TRADOC Regulation No. 351-4.
This JPA also contains information and guidance that is not in these three
references, but all information is compatible with them. It is designed to
lead users through the major steps and decisions required to perform a job
and task analysis.

Kincaid, J. P., Fishburne, R. P., Jr., Rogers, R. L., & Chissom, B. S.
   Derivation of new readability formulas (Automated Readability Index,
   Fog Count and Flesch Reading Ease Formula) for Navy enlisted personnel
   (NTTC-RBR 8-75). Millington, TN: Chief of Naval Technical Training,
   Naval Air Station Memphis, February 1975.

   Three readability formulas (Automated Readability Index [ARI], Fog Count,
and Flesch Reading Ease Formula) were recalculated to be more suitable for
United States Navy use. The three recalculated formulas were derived from
test results of 531 Navy enlisted personnel using multiple regression tech-
niques. The formulas are directly interchangeable because they were all
calculated using the same database. The ARI can be used when new material is
being written, as the new material is usually typed anyway. The Flesch
Formula is preferable when the Automated Flesch Count machine is available
and existing material is being graded for reading difficulty. The Fog Count
can be used when no equipment is available to aid the count.

Kishi, A. Task inventory construction (Tech. Rep. No. 14). Los Angeles, CA:
   California State University, Los Angeles, June 1976.

   This report is the fourteenth technical report of 16, published as part of
an evaluation of the United States Marine Corps task analysis program. The
objectives of the research were to determine an optimum inventory size that
would adequately cover the tasks without unduly fatiguing the Marine respon-
dents; to develop procedures for the phrasing of task statements to avoid
ambiguities and be understandable to as broad a range of Marines as possible;
and to develop recommendations for inventory design and format. An experi-
mental design is given for dividing a lengthy task inventory into a series of
shorter inventories; there is sufficient overlap of task statements in each
small questionnaire booklet to provide adequate samples of response to each
item. Data are presented from the application of six measures of readability
to nine task inventories. Guidelines for wording of task inventory items to
improve understanding are provided.

Kuriloff, A. H. Principles of training in Marine Corps task analysis:
Training Manual I (Tech. Rep. No. 7). Los Angeles, CA: California State
University, Los Angeles, December 1975.

This is the first in a series of five training manuals developed for use by
the Office of Manpower Utilization (OMU), Headquarters, United States Marine
Corps in its Task Analysis (TA) Program. This initial manual is designed for
trainers of OMU staff members assigned to the TA Program. The objectives of
this training manual are (1) to recommend procedures and training materials
for minimizing the time required to orient and train new TA team members;
(2) to increase the period of time new staff members will be productive on a
TA team by shortening the indoctrination and training period; and (3) to
upgrade skills for increasing the effectiveness and productivity of experi-
enced, as well as new members of TA teams. Principles of training are
discussed at a general level, and the reader is referred to other reference
sources to supplement this introductory manual.

Kuriloff, A. H., & Yoder, D. Communications in task analysis: Training
Manual IV (Tech. Rep. No. 8). Los Angeles, CA: California State Uni-
versity, Los Angeles, October 1975.

This report is the fourth in a series of five training manuals developed to
aid the Office of Manpower Utilization (OMU), Headquarters, United States
Marine Corps in the training and orientation of new staff members assigned to
the Task Analysis Program. The first section reviews problems of communica-
tion within an organization or task analysis team that can hinder effective-
ness, and it gives suggestions for improving the quality of intra-organiza-
tion communication. The second section stresses the importance of active
listening, recommendations for achieving active listening, testing for
understanding, and problems in active listening. The third section is the
most detailed and gives a broad range of guidelines on "How To Write Clearly."

Kuriloff, A. H., & Yoder, D. Teamwork in task analysis: Training Manual V
(Tech. Rep. No. 9). Los Angeles, CA: California State University, Los
Angeles, November 1975.

Each project in the United States Marine Corps' Task Analysis Program is
assigned to staff members, organized to form a work team. Their continuing
performance, as an effective team, is crucial for the success of the project.
This final training manual, in a series of five, provides guidelines for
effective teamwork, and work-team maintenance and development. Topics cov-
ered include organizational maintenance, development, and teamwork; manage-
ment by objectives; and use of the matrix organization structure.

Kuriloff, A. H., Yoder, D., & Stone, C. H. Training guide for observation
and interviewing in Marine Corps task analysis: Training Manual III
(Tech. Rep. No. 2). Los Angeles, CA: California State University,
Los Angeles, August 1975.

This training guide was developed for use by staff members of the Office of
Manpower Utilization (OMU), Headquarters, United States Marine Corps in their
preparation for task analysis projects. It is designed to provide basic
orientation to task analysis and detailed suggestions for carrying out the
entire observation and interview phase of the task analysis process. To
ensure the quality of findings, this training guide details specific recom-
mendations for all major steps in the data-gathering process including
improving interviews by checking questions, building respondent motivation,
developing listening ability, managing the interview, and improving both
observation and the recording of information. Suggested techniques were
drawn from the literature pertaining to job analysis, reliability and valid-
ity, interviewing, listening ability, improving observation, and communi-
cations.

Lobel, A. E., & Mulligan, J. F. Maintenance task identification and analysis:
Organizational and intermediate maintenance (AFHRL-TR-79-50). Brooks Air
Force Base, TX: Air Force Human Resources Laboratory, January 1980.

This report provides a draft military specification for use by United
States Air Force and other DoD agencies in specifying the requirements for
maintenance task identification and analysis (MTI&A). This specification
defines the requirements for the content and format of MTI&A to be used as a
basis for subsequent preparation of organizational and intermediate level Job
Performance Aids (JPA) called Job Guide Manuals (JGM) and Logic Tree Trouble-
shooting Aids (LTTA), as well as other types of technical manuals.

Appendix B of this report presents a list of permissible maintenance func-
tion verbs. Each verb is defined in terms of one or more meanings associated
with maintenance, and examples are provided. Any synonyms for a verb are
listed by order of preference (i.e., ranked), and the preference rank of the
verb itself is also indicated. Where necessary, special usage notes are also
included.

Mackie, R. R., Dick, R. A., Wylie, C. D., & Ridihalgh, R. R. : Research
leading to the development of a guidebook on the use of human resources
in electronic systems design (NPRDC Technical Note 81-17). San Diego, CA:
Navy Personnel Research and Development Center, June 1981.

This development effort was conducted under contract by Human Factors
Research, Inc. The objective was to develop information and techniques to
assist hardware developers in assessing the people-related implications of
their designs and for conducting manpower cost-effectiveness trade-off
studies during the design process. The procedures followed for the devel-
opment of task taxonomies used in this study are reported in pages 100-115.

The effort described in this technical note generated the data necessary to produce a first-generation guidebook of manpower and personnel-related information needed by hardware developers and program managers to assess the impact of candidate system designs on the United States Navy's human resources.. The guidebook has been published in a working draft for user evaluation as NPRDC Technical Note 79-8, "An Engineer's Guide to the Use of Human Resources in Electronic System Design," dated June 1979..

Manual of Navy enlisted manpower and personnel classifications and occupational standards - Section I: Navy enlisted occupational standards (NAVPERS 18068D). Washington, DC: Bureau of Naval Personnel, September 1975.

Section I of this manual presents 25-50 task statements for each pay grade of an enlisted rating, organized under 5-10 standard topic titles. Twenty-four occupational fields are listed in the table of contents, and an appendix contains a list of approved action verbs for task statements. NOTAP (Navy Occupational Task Analysis Program) surveys are used to create updated task statements.

Manual of Navy enlisted manpower and personnel classifications and occupational standards - Section II: Navy enlisted classifications (NAVPERS 18068D). Washington, DC: Bureau of Naval Personnel, September 1975.

Section II of this reference is the official manual for NEC (Navy Enlisted Classification) code identification of enlisted personnel and requirements. The NEC structure, of which the NEC coding system is a part, supplements the enlisted rating structure in identifying personnel on active or inactive duty and billets in manpower authorizations. NEC codes reflect special knowledge and skills that identify personnel and requirements when the rating structure is insufficient by itself for manpower management purposes.

Manuals, technical: Equipments and systems, content requirements for (MIL-M-15071H [NAVY]). Washington, DC: Department of the Navy, 17 July 1978.

This specification sets forth Naval Sea Systems Command (NAVSEA) and Naval Electronic Systems Command (NAVELEX) content requirements for manuals necessary for installation, operation, organizational-, intermediate-, and depot-level maintenance, repair, and parts support (without services of manufacturer's representatives) of equipment and systems. This specification is approved for use by all interested commands of the Department of the Navy and the Marine Corps, and is available for use by all other Departments and Agencies of the Department of Defense.

Manuals, technical: General style and format requirements (MIL-M-38784A).
Washington, DC. Department of Defense, 1 January 1975.

This specification covers the general style and format requirements for the
preparation of manuscripts and reproducible copy for standard technical
manuals and changes thereto. It also applies to nonstandard technical
manuals to the extent specified. Examples at the end of this specification
are typical and may be adapted to fit the specific equipment or situation
being covered. The paramount consideration in preparing a technical publi-
cation is its technical content. This content should be presented in lan-
guage free of vague and ambiguous terms, using the simplest words and phrases
which will convey the intended meaning.

Manuals, technical: Organizational maintenance instructions (MIL-M-38800A
[USAF]). Washington, DC: Department of Defense, 15 September 1974.

This specification covers the detailed requirements for preparation of
organizational maintenance manuals and checklists for aircraft, missiles, and
non-munition accessories which have a requirement for maintenance instruction
manuals. Appendix A adds a verb list to this specification. Each verb is
defined in terms of one or more meanings associated with equipment main-
tenance. A simple sentence is provided for each usage. A number entry in
the preference column indicates the standing of that verb compared to others
with the same or similar meaning (highest ranking is 1). Any synonyms with
which the verb was ranked are listed in terms of their own ranking. If a
synonym holds first rank, it is underlined. Where necessary, special usage
notes are also included. Lower ranking verbs can be used when the first-
ranked verb is particularly awkward or misleading in a given statement.

Marshall, C. T. Development of job descriptions and grouping of jobs.
Washington, DC: Navy Occupational Development and Analysis Center,
April 1977.

This special report begins with the task inventory booklet and proceeds
through the steps required to develop job descriptions and group jobs.
Simple illustrations are used to show results of the various computer pro-
cessing steps. The illustrations provide a systematic yet nontechnical
explanation of how job descriptions are developed and grouped by the
Comprehensive Occupational Data Analysis Programs (CODAP). The report is
concerned with the results of each processing action and not with computer
language, use of algorithms, or control devices. Each illustration is
preceded by a brief explanation.

McCormick, E. J. _Job analysis: Methods and applications_. New York, NY: American Management Associations, AMACOM, 1979.

This book incorporates much of McCormick's previous work. The text includes a discussion of job analysis methods; work-, behavior-, and attribute-requirement typologies; and applications of job analysis information to job design, job requirement determination, job evaluation, vocational choice, and work adjustment.

McCormick, E. J. Job and task analysis. In M. D. Dunnette (Ed.), _Handbook of industrial and organizational psychology_. Chicago, IL: Rand McNally, 1976.

This chapter begins with a brief overview of various aspects of job analysis and job analysis methods. The primary focus, however, is in terms of systematic approaches to the analysis of human work, including a discussion of various major efforts that have been made, namely, functional job analysis, the use of task inventories, and other forms of structured job analysis questionnaires such as the Position Analysis Questionnaire (PAQ). In addition, there is a discussion of the use of structured job analysis questionnaires as the direct basis for establishing aptitude requirements of jobs and of compensation rates for jobs, thus possibly eliminating conventional test validation procedures and job evaluation procedures.

McCormick, E. J., Jeanneret, P. R., & Mecham, R. C. _A study of job characteristics and job dimensions as based on the Position Analysis Questionnaire_ (Report No. 6). Lafayette, IN: Purdue University, Occupational Research Center, 1969.

This report is a summary of the several phases of a research program relating to the analysis of human work as characterized primarily in terms of "worker-oriented" job elements. A major facet of the program was that of identification of such job elements and their organization into job dimensions. In this connection it was hypothesized that there is some underlying "structure" of human work across the spectrum of jobs; this research program was directed in part toward the further clarification of such structure. In addition, however, certain phases of the program were directed toward the experimental application of job data based on job elements and job dimensions to certain practical personnel problems. One of these experimental applications dealt with job evaluation, and the other with the development of personnel requirements from essentially job analysis data.

McDermott, M. N., Paramore, B., & Callahan, W. T. Work in the Navy--A
description of Navy officer and enlisted occupations (Tech. Rep. No. 923).
Silver Spring, MD: Operations Research Inc., June 1975. (NTIS No.
AD-A011 093)

This report presents a discussion of the general work of the United States
Navy that includes a description of the special environment within which Navy
occupational tasks are performed; a description of each enlisted occupation
or "rating"; and a description of each officer category and specialty.

Melching, W. H., & Borcher, S. D. Procedures for constructing and using
task inventories (R&D Series No. 91). Columbus, OH: The Ohio State
University, The Center for Vocational Education, March 1973.

This manual provides methods, procedures, and forms to be used by job
analysts in constructing task inventories and by curriculum designers in
acquiring useful information concerning occupational performance. The
approach is an application of United States Air Force task inventory con-
cepts. The reader is guided through an explicit set of steps and procedures.
Also provided are the means by which the reader can periodically assess his
or her understanding of important concepts and terms introduced in the
manual.

Mitchell, J. L. Taxonomy of terms in job analysis (Tech. Note 78-02).
Lackland Air Force Base, TX: USAF Occupational Measurement Center,
June 1978.

Because the term "job analysis" is used to refer to the whole class of
studies of occupational information as well as to the study of a single job,
this paper points up the need to develop and consistently use a better de-
fined set of categories which will more precisely communicate the type of job
analysis to be undertaken and its purpose. C. L. Shartle's basic taxonomy of
job analysis terms is reviewed, and E. J. McCormick and J. Tiffin's summary
table of the uses of job and task analysis data is presented. The author
proposes a matrix approach to designating the levels and uses of job infor-
mation and provides sample cell entries in the resulting matrix display.

Moore, B. E. Occupational analysis for human resource development: A
review of utility of the task inventory (Research Report No. 25).
Washington, DC: Office of Civilian Manpower Management, Navy Department,
April 1976.

This report reviews the history and development of the task inventory
within the general context of occupational analysis. Three approaches to
occupational analysis were evaluated against a common set of attributes,
namely, engineering methods, functional job analysis, and the task inventory.

TI/CODAP (task inventory with computer assistance) comes closest to meeting the criteria of good occupational analysis. It also produces many useful products for job evaluation, manpower planning, and occupational structuring. CODAP, the software package developed by the United States Air Force Human Resources Laboratory for manipulating and analyzing task inventory data, was reviewed in order to indicate the kind and range of analyses possible. The author concludes that the relevance, utility, and comprehensiveness of the TI/CODAP approach seem to offer a significant step forward over other forms of occupational analysis.

Morsh, J. E., & Archer, W. B. Procedural guide for conducting occupational surveys in the United States Air Force (PRL-TR-67-11). Lackland Air Force Base, TX: Aerospace Medical Division (AFSC), Personnel Research Laboratory, September 1967. (NTIS No. AD-664 036)

This procedural guide sets forth in detail the procedures for collecting, organizing, analyzing, and reporting information describing work performed by United States Air Force officers and enlisted personnel. Specific steps in the application of the Air Force method of job analysis are presented in ·hronological order. This procedural guide is still one of the major refer-ences for how to perform an occupational analysis.

Mulligan, J. F., & Bird, J. B. Guidance for maintenance task identification and analysis: Organizational and intermediate maintenance (AFHRL-TR-80-21). Brooks Air Force Base, TX: Air Force Human Resources Laboratory, September 1980.

This report was prepared to develop guidance for United States Air Force, other DoD agencies, and industry in the use of specifications contained in AFHRL-TR-79-50 to fulfill the requirements for maintenance task identification and analysis (MTI&A). This report is to be used as a handbook. It includes definitions, procedures, planning data, staffing criteria, check-lists, suggested forms, and guidelines for review, evaluation, and quality audit of MTI&A products. The guidance provided by the specification and this handbook are suitable for the procurement of MTI&A for both organizational and intermediate levels of maintenance.

Navy maintenance and material management information system - Equipment identification code master index (MSO 4790.E2579). Mechanicsburg, PA: Navy Fleet Material Support Office, Maintenance Support Office Department.

The Equipment Identification Code (EIC) Master Index is the primary source for the codes assigned to identify shipboard system, subsystem, and equip-ments when documenting maintenance actions in accordance with procedures prescribed in OPNAV 4790.4, 3-M system manual. A revised EIC Master Index is published periodically (annually or semi-annually) based on the volume of significant changes.

Navy occupational analysis in the 1970's: A brief overview of the Navy
   Occupational Task Analysis Program (NOTAP)--Its methodologies and uses.
   Washington, DC: Navy Occupational Development and Analysis Center, May
   1977.

   This overview briefly describes the United States Navy system for con-
ducting job task analysis. Data collection is accomplished using a task
inventory questionnaire administered to job incumbents in the fleet. NOTAP
data are used in the naval training community for various purposes, in
revising occupational standards, in developing manning and training require-
ments for new systems and equipment, in rating structure and classification
systems management, and in many other ways.

Noel, J. V., Jr., & Beach, E. L. Naval terms dictionary (4th ed.). Annap-
   olis, MD: United States Naval Institute, 1978.

   With some 5,000 entries, this expanded and revised fourth edition of the
Naval terms dictionary is an easy-to-use compilation of technical termi-
nology, coloquialisms, and slang currently in use in the United States Navy.
The entries are arranged alphabetically, and italics are used to indicate
cross-referenced words or phrases. Five appendices contain a variety of
hard-to-find information: (1) Navy ship types, (2) Navy enlisted rating
structure, (3) aircraft-designation system, (4) missile-designation system,
and (5) electronics nomenclature (AN system).

Ostrofsky, B. Design, planning, and development methodology. Englewood
   Cliffs, NJ: Prentice-Hall, Inc., 1977.

   This textbook presents the sequential decision structure necessary to
design or to plan for a system at sufficient depth to enable engineers and
managers to grasp the scope of the interdisciplinary nature of these activi-
ties. Part I provides an overview of the design-planning purpose, scope, and
content. Part II describes the activities of the feasibility study, result-
ing in a set of alternatives or candidate systems. In Part III, the neces-
sary steps in structuring the analyses for choosing among the candidate
systems is presented. The activities required for implementing the results
of the preliminary activities are identified in Part IV. The reason for
including this reference in the Annotated Bibliography is that an appendix to
Chapter 23 defines and illustrates a typical breakdown of tasks for a large-
scale, closed-loop operations/maintenance system.

Pass, J. J., & Robertson, D. W. Methods to evaluate scales and sample size
   for stable task inventory information (NPRDC TR 80-28). San Diego, CA:
   Navy Personnel Research and Development Center, May 1980.

   Methods were developed to determine: (1) the stability and redundancy of
responses to two job task scales—the continuous Relative Time-Spent scale
and the dichotomous Task-Performed scale, (2) the stability of "job types"

(i.e., clusters of job incumbents) derived from scale responses, and (3) the change in stability when sample size is reduced. Results indicated that the Task-Performed scale yields stable, meaningful task information (i.e., percentages of personnel performing tasks) from responses by job incumbents, but no practical gain in information is achieved from the Relative Time-Spent scale. A better way to collect time-spent data is proposed. Findings also demonstrate that highly stable scale data and cluster solutions are obtainable from samples substantially smaller than those presently administered. The study's empirically developed relationship between sample size and stability can be usefully employed to determine cost-effective sampling for task inventory surveys.

Phalen, W. J. Comprehensive Occupational Data Analysis Programs (CODAP): Ordering of hierarchically grouped case data (KPATH) and print KPATH (PRKPTH) programs (AFHRL-TR-75-32). Brooks Air Force Base, TX: Air Force Human Resources Laboratory, August 1975. (NTIS No. AD-A016 724)

This is one in a series of reports written to acquaint occupational analysts, occupational research personnel, and personnel managers with the functions and utilities of a set of Comprehensive Occupational Data Analysis Programs (CODAP). This technical report describes and gives examples of applications of the Ordering of Hierarchically Grouped Case Data (KPATH) and Print KPATH (PRKPTH) programs. These programs greatly facilitate the identification of background variables having similar values for all or most cases in any hierarchical group. Because of the highly technical nature of this report, it is of interest only to readers who have a need to understand how the CODAP KPATH and PRKPTH programs function.

Procedures for instructional systems development (NAVEDTRA 110). Pensacola, FL: Chief of Naval Education and Training, 12 July 1978.

This manual is a summary of the first four volumes of the 5-volume Interservice procedures for instructional systems development (NAVEDTRA 106A) and contains specific procedures and formats for application by the United States Navy. This manual is Part I of a 2-part supplement to NAVEDTRA 106A, designed to be used by all NAVEDTRACOM activities. It was prepared for those who will be analyzing, designing, developing, implementing, and controlling instructional programs for naval personnel. This manual is currently being revised.

Procedures for the planning, design, development, and management of Navy technical training courses (CNTT-A10 [Rev. 4-76]). Millington, TN: Chief of Naval Technical Training, April 1976.

This manual contains the procedures to meet unique needs in planning, design, development, and management of Chief of Naval Technical Training courses. Prior to the publication of this manual, Interservice procedures

for instructional systems development (NAVEDTRA 106A) was promulgated for use throughout the Naval Education and Training Command. NAVEDTRA 106A is the basic publication for instructional systems development (ISD), while this manual is designed for specific requirements of the Naval Technical Training Command.

Questionnaire construction manual (P-77-1). Fort Hood, TX: United States Army Research Institute for the Behavioral and Social Sciences, July 1976. (DTIC No. ADA 037 815)

This manual was prepared primarily for the use and guidance of those who are tasked to develop or administer questionnaires as part of United States Army field tests and evaluations. The general content and concepts, however, should be useful to anyone involved in constructing or administering surveys, interviews, or questionnaires. Chapter 1 is an Introduction to this manual. Chapters 2-10 present guidance on preparing, assembling, and arranging items in questionnaires. Chapter 11 discusses the importance of and procedures for pretesting questionnaires prior to their regular administration. Chapter 12 discusses characteristic. of respondents that influence questionnaire results. Chapter 13 deals briefly with analysis and evaluation of responses, and Chapter 14 discusses interview presentation.

Ramsey-Klee, D. M. Taxonomic approaches to enlisted occupational classification: Vols. I and II (NPRDC TR 80-7). San Diego, CA: Navy Personnel Research and Development Center, December 1979.

Task inventory data for five representative United States Navy enlisted ratings were studied to (1) define the taxonomic structure underlying the design of the Navy Occupational Task Analysis Program's task inventory booklets, and to (2) develop alternative taxonomic methodologies that will extend the usefulness of the task inventory data and shorten the task inventories, thereby reducing time demands on operational units during their administration.

A survey of the literature revealed that no published taxonomic methodology could be applied directly to improve the task inventory booklets. Consequently, a composite content analytic methodology and clustering methodology were developed. Applying the content analytic methodology to the task inventory data demonstrated that this procedure can be used effectively to compare Navy ratings, relate task analysis data to occupational standards, and systematically generate task statements.. The recommended method includes a pool of standardized task statements that could be used to create new task inventory booklets and training curriculums.

Reigeluth, C. M., & Merrill, M. D. Extended task analysis procedure (ETAP): Training materials. Syracuse, NY and Los Angeles, CA: Syracuse University and the University of Southern California, August 1980.

The Extended Task Analysis Procedure (ETAP) is a 12-step process designed to analyze tasks that are primarily procedural in nature, and tasks that are usually called "soft skill" tasks. Soft skill tasks are those that require so many decisions about the appropriate behavior under various circumstances, that the task cannot be reduced to a specified procedure. These soft skill tasks are called transfer tasks to distinguish them from procedural tasks. Built into the 12 steps of ETAP are three different approaches to analysis depending on the type of task to be analyzed--Procedural Analysis, Factor-Transfer Analysis, and Principle-Transfer Analysis. These training materials include eight lessons. Lessons 1-7 are in a definite sequence and should be studied in order. The last lesson--Lesson 8--teaches a standard notation system for numbering the different levels and types of tasks described in ETAP.

Reigeluth, C. M., & Merrill, M. D. Extended task analysis procedure (ETAP): User's manual. Syracuse, NY and Los Angeles, CA: Syracuse University and the University of Southern California, August 1980.

Extended Task Analysis is a procedure for identifying the component skills and knowledges which must be learned if the whole task is to be mastered. The procedure meets the needs of both task description and subsequent instructional design, and is an effective method to use for a wide variety of tasks. This user's manual has been designed to assist the analyst to do an Extended Task Analysis. It is a handy reference for anyone who has already completed training in the use of ETAP.

Riccobono, J. A., & Cunningham, J. W. Work dimensions derived through systematic job analysis: A replicated study of the Occupation Analysis Inventory (Center Research Monograph No. 9). Raleigh, NC: North Carolina State University at Raleigh, Center for Occupational Education, 1971.

In a previous study, work dimensions (factors) were derived from ratings of a representative sample of approximately 400 jobs on the Occupation Analysis Inventory (OAI). The OAI contained 622 work elements describing various types of work activities and conditions. A follow-up to this study is reported in this monograph. The replication yielded different factors from those obtained in the earlier study. The implications of this difference are discussed.

Royle, M. H., & Robertson, D. W. Job satisfaction measures as predictors of retention for Navy enlisted personnel (NPRDC TR 81-2). San Diego: Navy Personnel Research and Development Center, December 1980.

Responses made by members of four representative ratings to the job satisfaction items on the Navy Occupational Task Analysis Program (NOTAP) surveys were analyzed to determine the relationship between job satisfaction and intent to reenlist. Response data obtained from enlisted personnel in a survey of career counselor effectiveness were analyzed to determine actual reenlistment behavior, since this information could not be obtained from NOTAP data. Aspects related to the work itself predicted overall job satisfaction, while those related to military life predicted reenlistment intent. Reenlistment intent was highly related to actual reenlistment, while other variables (including job satisfaction) added little to prediction of enlistment.

Rundquist, E. A. Criteria for evaluating a job analysis for training design (Tech. Note 78-15). San Diego, CA: Navy Personnel Research and Development Center, July 1978.

The utility of job-analysis output for training design was analyzed in terms of three questions: (1) To which training-design decisions can the results of a job analysis be expected to contribute? (2) What characteristics give job-analysis output utility for training design? (3) What requirements need to be considered before criteria are applied? Criteria were developed for judging job-analysis output for training design. Important independent requirements are the organization of the output and the characteristics of the job-task statements.

Sauer, D. W., Campbell, W. B., Potter, N. R., & Askren, W. B. Human resource factors and performance relationships in nuclear missile handling tasks (AFHRL-TR-76-85/AFWL-TR-76-301). Brooks Air Force Base, TX: Air Force Human Resources Laboratory, May 1977.

The objective of this study was to determine quantitative relationships between human resource variables and technician performance on maintenance tasks for nuclear missile systems. Human resource variables relevant to maintenance operations were identified. Instruments for measuring the human resource variables and task performance measures were developed. An 11-category taxonomy (of task action verbs and their definitions) was developed for coding the maintenance tasks. Data on task performance, human resource variables, and technician opinions were collected from United States Air Force records or from technicians working at five Air Force bases. Statistical analyses of the data were performed. The results of this well-designed and executed study are numerous, and these findings have important implications for future Air Force research..

Silverman, J. A method for structuring technical tasks (Tech. Bulletin STB 66-4). San Diego, CA: U.S. Naval Personnel Research Activity, August 1965.

This technical bulletin describes techniques for measuring the complexity and variety of tasks as part of an analysis of tasks and patterns of tasks in terms of the technical dimension of the work situation. A supplement to this technical bulletin (STB 66-4A) contains the major data collection instruments: structure of functions scale, equipment rating form, engineering task lists, task complexity classification list, and task comparison forms.

Silverman, J. New techniques in task analysis (SRM 68-12). San Diego, CA: U.S. Naval Personnel Research Activity, November 1967. (NTIS No. AD-663 135)

By classifying the behaviors required in performing a task, and training personnel in the basic abilities implied by those behaviors (rather than the specific technical elements in a task), this research contends that curriculums may be made more realistic in terms of task demands. A set of such categories of task behavior has been called a taxonomy. A taxonomy is defined, and the steps in the taxonomic process are delineated. The problems of task classification can be approached more systematically through methods of numerical taxonomy than through traditional classification techniques.

Sticht, T. G. (Ed.). Reading for working: A functional literacy anthology. Alexandria, VA: Human Resources Research Organization (HumRRO), 1975.

This anthology presents the research that HumRRO has done on literacy in relation to work. It is also a collection of the results of their work for application in education and training activities as well as in development of job materials. The volume is divided into three parts: (1) determining functional literacy demands of jobs, (2) reducing discrepancies between literacy skills of personnel and literacy demands of jobs, and (3) collected papers on functional literacy.

Stone, C. H. Evaluation of the Marine Corps task analysis program (Tech. Rep. No. 16). Los Angeles, CA: California State University, Los Angeles, June 1976.

The basic objective of this research project was to determine the effectiveness of the United States Marine Corps Task Analysis (TA) Program as it has been conducted by the Office of Manpower Utilization (OMU). This report summarizes the main findings and conclusions in the eight research areas into which the study was divided: (1) TA observation and interview procedures; (2) task inventory construction; (3) occupational field sample size;

(4) computer procedures and data analysis; (5) OMU organization and personnel; (6) orientation, training, and team performance; (7) peace-time TA and its relation to war-time conditions; and (8) the use of worker characteristics in classification and assignment. The overall conclusion is that the TA program is a highly valuable asset to the Marine Corps in improving and maintaining effective utilization of its human resources. An appendix i this final report contains an annotated list of the 15 technical reports th are end products of this project.

Task inventory development procedures. Washington, DC: Navy Occupational Development and Analysis Center, February 1981.

This internal NODAC manual is a compilation of three years of note taking, article reading, and philosophy based upon conversations with many persons involved in the occupational analysis and training fields. Four major phas_; in the task inventory development process are described in detail in this manual: (1) research and preliminary construction, (2) predeployment, (3) observation and interview, and (4) final construction and review. Ten appendices provide additional procedural guidance.

Thew, M. C., & Weissmuller, J. J. CODAP: A current overview. Brooks Air Force Base, TX: Air Force Human Resources Laboratory, 1979.

This paper presents an overview c~ the Comprehensive Occupational Data Analysis Programs (CODAP) system designed to familiarize a new occupational analyst with various perspectives on the system and to provide a broad-brus view of a typical analysis being translated into the necessary sequence of computer programs. The three perspectives chosen are (1) the research approach, (2) the procedures, and (3) the programs. For each of the three perspectives discussed, a basic definition is provided. Appendix A to this paper presents a CODAP program summary. Listed are descriptions of the 49 major computer programs associated with the United States Air Force CODAP package.

U.S. Department of Labor, Manpower Administration, Bureau of Employment Security. Dictionary of occupational titles - Volume I: Definitions of titles (4th ed.). Washington, DC: U.S. Government Printing Office, 197

Volume I of this dictionary contains names and definitions of the various occupations in the United States economy, arranged alphabetically accordin to the job titles. Other names by which the same jobs are known in variou. sections of the country are called alternate titles and are also included. Data contained in the definitions include information on WHAT gets done, H V it gets done, and WHY it gets done. Each job definition is assigned one o more industry designations. Individual occupations are incorporated into a classification structure and identified by 6-digit code numbers.

U.S. Department of Labor, Manpower Administration, Bureau of Employment
Security. Dictionary of occupational titles - Volume II: Occupational
classification (4th ed.). Washington, DC: U.S. Government Printing
Office; 1976.

Volume II of this dictionary complements Volume I and serves as a method
of grouping jobs having the same basic occupational, industrial, or worker
characteristics to help the user discern relationships among occupations. It
also provides a standard approach to classifying the abilities, vocational
experiences, and potentials of workers.

HANDBOOK FOR CONSTRUCTION OF TASK INVENTORIES

FOR NAVY ENLISTED RATINGS

APPENDIX A

A GLOSSARY OF

JOB TASK ANALYSIS TERMS
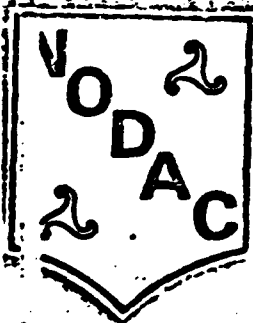
"A" SCHOOL: Schools that provide the basic technical knowledge and skills required to prepare for job entry level performance and further specialized training, including apprenticeship training. An NEC, NOBC, MOS, or AFSC may be awarded to identify the skill achieved.

ACTION VERB: An action verb is one of the basic elements of a task statement and is descriptive of what is being done in the task. The action verb usually is in the present tense (e.g., repair), although it sometimes appears in the gerund form (e.g., repairing). The subject of the action is understood to be "I" so that the task statement unambiguously refers to what the respondent does on the job.

APPRENTICE: A relatively unskilled person who has officially entered an occupational field. Performs certain basic tasks and assists journeymen in tasks requiring higher skill levels. During this time, the individual is being trained for entry into journeyman status. Usually describes the E1-E4 pay grade levels of a rating.

AUDIT TRAIL: A methodical, documented record of rationale, data sources, events, problems, decisions, and products resulting from the processes and procedures used in constructing a task inventory or in conducting a job/task analysis.

BILLET (JOB): The basic personnel unit of a naval organization that requires the full-time services of one individual (incumbent). A billet has the following characteristics: (1) it normally utilizes related skills and knowledge, and (2) it is officially established with a definite purpose and scope and exists even when vacant. A billet typically consists of a cluster of duty assignments covering the routine, general quarters, watch, and other types of military or rating-related duty assignments. See also JOB.

"C" SCHOOL: Instructional courses that provide advanced knowledge, skills, and techniques needed to perform a particular job in a billet and/or a course that awards a skill (NEC or NOBC) or is a prerequisite to a skill-awarding course; skill progression training.

CLUSTER:.
1. In NOTAP data analysis, a group of persons performing a number of common tasks, or spending similar amounts of time on like tasks. See also CLUSTER TITLE.
2. In course design, tasks grouped for training by task characteristics such as skill level, rank, or by special facilities required.

CLUSTER TITLE: In NOTAP data analysis, a designation for a group of persons whose responses are very similar in tasks performed and time spent on each task. See also CLUSTER.

CODAP: An acronym for a computer system of Comprehensive Occupational Data Analysis Programs developed by the Human Resources Laboratory of the United States Air Force. Approximately 50 programs comprise this software package which is used by all branches of the military service for processing and analyzing respondent data collected by occupational survey instruments.

COMMON CODING: A term used by the Navy Occupational Development and Analysis Center (NODAC) to mean mapping each standard task statement in the NODAC catalog onto its corresponding occupational standards. In this catalog, a list of rates to which each task statement applies follows each statement.

COMPONENT: A subassembly of an equipment with a specific function or circuit that contributes to the total equipment function. A major subunit of an equipment, a number of parts, subassemblies or modules joined together to perform a specific function. A component is normally encased as a separate unit, and may perform its function within a number of different equipments or systems.

> NOTE: For the purpose of describing task levels, a circuit
> is an assembly of parts that performs a specific
> low-level function within an electric or electronic
> system.

CONDITIONS: Conditions describe constraints (physical, legal, or other), safety considerations, tools or materials to be available, and specific aspects of the environment in which a task is to be performed.

> EXAMPLES: In the dark, in the rain, underway, on a
> destroyer, from memory.

COVERT BEHAVIOR: Thinking/mental processes inferred from overt behavior. Covert behavior may have an observable product or result. See also OVERT BEHAVIOR.

CRITICALITY: The degree to which an element is essential to the performance of a task. Critical elements are those which must be performed correctly to preclude injury to personnel, damage to equipment, or improper operation.

CUE: A word, signal, or prompt that causes the individual to perform the task action.

> EXAMPLE: Task Action: Troubleshoot the rectifier power
> supply.
>
> Cues: 1. Equipment fails to meet standards
> during an operational check.
> 2. Equipment malfunctions.

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DUTY: One of the major subdivisions of work performed by one individual, generally performed according to a prescribed method to meet a set standard. One or more duties constitute a job. A duty normally exists in one functional area and is characterized as follows: (1) it is a recognized segment of a job that occupies a principal portion of a job incumbent's work time, (2) it occurs repeatedly and/or frequently in the work cycle, and (3) it involves work requiring closely related skills and knowledge.

DUTY CATEGORY/HEADING/TITLE: Categorizes groups of tasks under identifiable headings to help in organizing lists of tasks. Duty titles should begin with an action word ending in "ing" (gerund).

    EXAMPLE: Performing Corrosion Control and Material Preservation.

EIC: See EQUIPMENT IDENTIFICATION CODE (EIC).

ELEMENT: See TASK ELEMENT.

ENABLING OBJECTIVE: A 3-part objective that helps the student achieve a terminal learning objective. It describes the behavioral actions, the performance conditions, and the attainment standard expected of the student when he or she completes the task.

EQUIPMENT: A major assembly constituting either a system with a specific function or one of several assemblies contributing to a total system.

EQUIPMENT IDENTIFICATION CODE (EIC): A 4-character code identifying equipment in the Navy 3-M (Maintenance and Material Management) system. Codes and equipments are cross-referenced in Navy maintenance and material management information system - Equipment identification code master index (MSO 4790.E2579).

"F" SCHOOL: Schools that provide team training to fleet personnel who are current or prospective members of shipboard teams with specific functions. These schools also provide individual refresher, operator, maintenance, or technical training of less than 13 calendar days as required by fleet or type command needs.

FINGER COURSES: Instructional courses, usually taught in "C" schools, that provide specialized training in specific technical knowledge and skills as opposed to basic technical knowledge and skills.

FRONT-END ANALYSIS: Refers to job analysis, selection of tasks for training, and development of Job Performance Measures (JPMs).

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HIERARCHY: A body of entities, objects, or items within a subject field organized, classified, or arranged in a graded series. A hierarchical arrangement reflects levels of specificity, starting from the very general and going to the more specific, with the specific always being included in the general.

INSTRUCTIONAL SYSTEMS DEVELOPMENT (ISD): An orderly process for planning, developing, implementing, and evaluating instructional programs which ensures that personnel are taught the knowledges, skills, and attitudes essential for successful job performance.

JOB: The duties and tasks performed by a single worker constitute his or her job. If identical duties and tasks are performed by several individuals, they all hold the same job. See also BILLET (JOB).

JOB COMMUNITY/CLUSTER: A group of persons who perform identical or closely related jobs within a rating. Job communities are characterized by NECs, primary duties, systems or equipment, skill levels, platforms, and any unique features of the family of tasks involved. In the Navy, service ratings are one example of job communities.

JOB INCUMBENT: An individual holding a particular job or occupying an assigned billet; job holder/billet occupant.

JOB/OCCUPATIONAL ANALYSIS: The basic method used to obtain a detailed listing of duties, tasks, and task elements necessary to perform a clearly defined, specific job. It involves observations of workers and conversations with those who know the job, in order to describe in detail and comprehensively the work involved, including conditions and standards.

JOB PERFORMANCE AID: A chart, check list, document, guide, instruction sheet, or other device that facilitates job performance by reducing the amount of information the job incumbent must recall or retain in order to successfully carry out the task.

JOB PERFORMANCE MEASURE (JPM): A test used to determine whether or not a job incumbent meets job task standards. The JPM measures a job incumbent's proficiency in performing a task in the job environment. JPMs are designed principally for the evaluation of job incumbent performance, not student performance in a training environment; however, the JPM is frequently used for both.

JOB TASK ANALYSIS: The process of determining the duties and tasks that are, or should be, performed by persons occupying a given type of billet, working in the same rating, or fulfilling a given job function. See also TRAINING TASK ANALYSIS.

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JOB TASK INVENTORY (QUESTIONNAIRE): The instrument used to collect essential data for the job analysis is the task inventory. The inventory collects background information and occupational data in the form of statements of tasks performed, usually arranged by duty categories. Respondents may also be asked to rate each task performed on a number of factors. Other job-related information that may be collected include job titles, collateral duties, equipment usage, job satisfaction, physical demands, and other dimensions that add depth to the analytical process.

JOURNEYMAN: A person who operates or maintains components and systems within an occupational field; exercises supervisory duties limited or isolated to occupational field subsystems; trains subordinates within the occupational field. Usually describes the E5-E6 pay grade levels of a rating.

JPA: See JOB PERFORMANCE AID (JPA).

JPM: See JOB PERFORMANCE MEASURE (JPM).

JURY OF EXPERTS: A group of subject matter experts selected to record, organize, and pass judgment on data and other matters related to the specific field or area of expertise.

KNOWLEDGE: A substantial amount of related information that can be recalled with or without the aid of documentation. Knowledge is distinguished from small amounts of unrelated pieces of information that can be rapidly learned. Knowledge in itself is not a skill, but a prerequisite for the application of skills. Skills may require recall of knowledge.

LEARNING OBJECTIVE: Describes precisely what is to be learned in terms of the expected student performance under specified conditions to accepted standards. These learning objectives identify the mental skills, information, attitudes, or physical skills that are required to perform the terminal learning objective.

LEVEL OF SPECIFICITY/DETAIL: The level of specificity or detail that is appropriate for the task statements of a job task inventory questionnaire or occupational survey is dependent on the purpose for which the statements will be used. Greatest specificity is needed for making decisions about the curriculum content of training programs. More general statements are suitable for purposes of occupational description.

MANAGER: A person who controls and directs the implementation of command policies within the enlisted community associated with an occupational field, or across occupational fields, as required. Usually describes the E8-E9 pay grade levels of a rating.

MENTAL SKILLS: Information handling intellectual processes including identifying, associating, classifying, discriminating, chaining, using rules/solving problems. Mental skills are the capability of applying learned information to some practical and measurable situation.

    EXAMPLES: Evaluating a tactical situation is done by the mental skill of integrating appropriate information; the determination of whether radar controls are properly set is done by differentiating radarscope presentations which indicate properly set controls from those that are set improperly.

MNEMONIC: A device, such as a formula, rhyme, abbreviation, etc., used as an aid in remembering.

MODULE: An assembly or combination of parts, circuits, subassemblies and assemblies mounted together. A subassembly or a component with a specific function or circuit that contributes to the total component function. A module is a subunit of a component or equipment.

    EXAMPLES: A printed circuit board, a power supply section, a gear box, a control unit, an electric motor, or a hydraulic pump.

MULTIPLE TASK: A task that has a variety of possible elements. There are two basic types: One is always performed by following the same basic procedures; the other is one in which the inputs vary, with the task performed differently depending on the input. A type of task which may be identified during job analysis.

NAVY ENLISTED CLASSIFICATION (NEC): NEC codes reflect special knowledge and skills that identify personnel and requirements when the rating structure is insufficient by itself for manpower management purposes. A listing of NECs for each rating can be found in Navy enlisted manpower and personnel classifications and occupational standards – Section II: Navy enlisted classifications (NAVPERS 18068D).

NEC: See NAVY ENLISTED CLASSIFICATION (NEC).

NOTAP (NAVY OCCUPATIONAL TASK ANALYSIS PROGRAM): A program designed to gather, assemble, computerize, and analyze occupational data; prepare and publish analysis reports on data collected; and provide appropriate printouts and special studies for use by manpower personnel and training managers.

OBSERVATION AND INTERVIEW (O&I): A job holder is observed in the job environment performing all or a substantial part of the job; the job holder performs the job while the analyst asks questions.

OCCUPATIONAL ANALYSIS: See JOB/OCCUPATIONAL ANALYSIS.

OCCUPATIONAL BRIEF: The report summarizing the results of a Navy occupational survey. This report is produced by the Navy Occupational Development and Analysis Center.

OCCUPATIONAL FIELD: A group of persons who are engaged in closely related occupations (professions and/or vocations). The allied health care field, for example, consists of physicians, nurses, nurse practitioners, medical technicians, medical therapists, orderlies, etc. Examples of Navy enlisted occupational fields are administration, construction, marine engineering, aviation maintenance/weapons, and ship maintenance.

OCCUPATIONAL STANDARDS: The minimum standards for tasks required of enlisted personnel within specific occupational entities (ratings and rates). Navy occupational standards are prepared by a department of NODAC and are contained in NAVPERS 18068D, Manual of Navy enlisted manpower and personnel classifications and occupational standards - Section I: Navy enlisted occupational standards.

OCCUPATIONAL SURVEY REPORT: The report summarizing the results of an Air Force occupational survey. This report is produced by the Air Force Occupational Measurement Center.

OJT: See ON-THE-JOB TRAINING (OJT).

ON-THE-JOB TRAINING (OJT): Training in a task or duty while engaged in its performance during daily operation and maintenance situations. The training can be part of a formal program or simply, and more commonly, knowledge and skills acquired primarily on the initiative of the individual learner.

OVERT BEHAVIOR: Behavior which is observable/measurable. See also COVERT BEHAVIOR.

PAR: See PERSONNEL ADVANCEMENT REQUIREMENT (PAR).

PART: The smallest units in an equipment, component, or module whose unit totality contributes to the operational function of the equipment, component or module. One piece, or two or more pieces joined together and not subject to disassembly without destruction of designed use.

PAY GRADE: There are nine pay grades for naval enlisted personnel reflecting a person's level of proficiency within a naval rating as follows: E-1 - Recruit; E-2 - Apprentice; E-3 - Seaman/Fireman/etc.; E-4 - Petty Officer Third Class; E-5 - Petty Officer Second Class; E-6 - Petty Officer First Class; E-7 - Chief Petty Officer; E-8 - Senior Chief Petty Officer; E-9 - Master Chief Petty Officer. See also RATE.

PERSONNEL ADVANCEMENT REQUIREMENT (PAR): A description of the minimum requirements for enlisted advancement, used by individuals to prepare for advancement and by commands to determine individual readiness for advancement. Contains occupational and military requirements based on NAVPERS 18068 series, and administrative and formal school training requirements

PERSONNEL QUALIFICATION STANDARDS (PQS): The PQS system is a method for qualifying officer and enlisted personnel to perform assigned duties. A PQS is a written compilation of knowledge and skills, derived from task analysis, required to qualify for a specific watch-station, maintain a specific equipment or system, or to perform as a team member within the assigned unit. The PQS also contains the standards by which the required performances may be judged.

PHYSICAL SKILLS: Specified muscular activities for accomplishing a goal; manual dexterity or manipulative activity basic to the performance of a task. Physical skills employ mental activities to some measure.

    EXAMPLES: Operating electronic test equipment, using a
               welding torch, driving a car, firing a rifle,
               digging a ditch.

PLATFORM: The unit (e.g., ship or aircraft type, shore facility, etc.) where task actions are performed.

PQS: See PERSONNEL QUALIFICATION STANDARDS (PQS).

PRELIMINARY TASK LIST: A comprehensive list of every task performed on the equipment being analyzed. It includes all tasks referenced in available technical manuals, PQS, NOTAP, MRCs, and other documents, as well as tasks known to the SMEs but not otherwise listed. These tasks are listed in the order in which they are performed.

RATE: Level of proficiency within a naval rating equated to the pay grade for enlisted personnel (E-1, E-2,...., E-9). For example, RM3 signifies a Radioman, Third Class corresponding to the E-4 pay grade. See also PAY GRADE.

RATE TRAINING MANUAL: A manual designed for enlisted personnel to study for advancement examinations and published by the Chief of Naval Education and Training. It may be used as a text or reference in a Navy school, as a reference for questions in Personnel Qualifications Standards, as a text for a correspondence course, and as a self-study manual. It covers the qualifications for advancement by actual inclusion of the necessary information or by reference to available sources of this information. For most ratings, each rate training manual covers two rates--the E-4 and E-5 rates in one manual and the E-6 and E-7 rates in another. (Formerly called "Navy Training Course.")

RATING: An enlisted occupational specialty in the Navy made up of duties calling for closely related skills, knowledge, abilities, and aptitudes. The rating is the basic occupational unit used in carrying out the personnel actions of selection, training, classification, and assignment.

SAMPLE: A finite number of observations, individuals, or units selected from those which comprise a particular universe for the express purpose of making an inference about the universe; often assumed to be representative of the total group, or universe, of which it is a part. A general term referring to a group selected by any means to represent a population.

SERVICE RATING: Required specialization (usually at the lower pay grades) in certain phases of a broad occupational field. Using the fire control technician rating as an illustration, at the petty officer third, second, and first class levels, a person in this field specializes in either of two service ratings--FTG (gun fire control technician) or FTM (missile fire control technician). At the chief petty officer level, the job incumbent is required to acquire a broader knowledge covering both guns and missiles in the general rating of fire control technician.

SKILL: A set of related physical and/or mental competencies capably applied to a specific task or group of related tasks. A skill requires considerable precision and is learned through extensive practice and study. It may be applied to several tasks or jobs with little or no transfer of training required. A skill implies proficiency which is measured by quality or quantity task performance criteria.

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<u>SKILL LEVELS</u>: The proficiency levels (apprentice, journeyman, supervisor, and manager) of task performance. A designation used to indicate proficiencies at different places along a continuum of skills from the least to the most.

<u>SME</u>: See <u>SUBJECT MATTER EXPERT (SME)</u>.

<u>SMS</u>: See <u>SUBJECT MATTER SPECIALIST (SMS)</u>.

<u>SOFT SKILL</u>: Skill to perform jobs where job requirements are not specifically defined in terms of actions to be taken and expected outcomes. Typically an area of performance that does not have a definite beginning and end as do hard skill areas.

    EXAMPLES: Coaching, counseling, managing, supervising, and leadership.

<u>SPECIFICITY</u>: See <u>LEVEL OF SPECIFICITY/DETAIL</u>.

<u>STANDARD</u>: A statement of how well a task must be performed; refers to the acceptable quality of performance of a task in the real-world job environment. Task standards are the basis for job performance measure standards.

<u>SUBJECT MATTER EXPERT (SME)</u>: A technical specialist who has high level knowledge and professional skill in the performance of some job and who is consulted by a task analyst or an instructional designer in the process of job task analysis. An SME may be a generalist with broad background and experience in a particular rating, or an expert in specific, specialized areas of a rating. (Navy usage) See also <u>SUBJECT MATTER SPECIALIST (SMS)</u>.

<u>SUBJECT MATTER SPECIALIST (SMS)</u>: A technical specialist who has professional skill in the performance of some job and who is consulted during training task analysis. An SMS who has extensive field experience makes a better technical advisor than one who is an excellent instructor but is limited in actual operational experience. The ideal SMS is one with both instructor experience and recent "hands on" operational experience. (Air Force usage) See also <u>SUBJECT MATTER EXPERT (SME)</u>.

<u>SUBSYSTEM</u>: A major functional subassembly or grouping of items or equipment which is essential to the operational completeness of a system.

<u>SUBTASK</u>: See <u>TASK ELEMENT</u>.

SUPERVISOR: A person who oversees and directs the job performance of subordinates within an occupational field; performs/manages personnel and administrative functions within an occupational field; trains subordinates. Supervisory personnel usually are at the E-7 pay grade level of a rating.

SYSTEM: Any organized assembly of equipments and procedures united and regulated by interaction or interdependence to accomplish a set of specific functions. A combination of equipments or of equipments and components that perform operational functions.

> EXAMPLES: Airborne early warning systems, airconditioning
> systems, fire control systems.

TASK: A unit of work that occupies a significant portion of work time spent in the performance of a duty. It is the most specific level of behavior in a job and describes the performance of a meaningful job function in terms of a specific action applied to a particular object. The behavior must be observable, have a definite beginning and end, and result in a completed work action or a measurable work product.

TASK DELAY TOLERANCE: A measure of how much delay can be tolerated between the time the need for task performance becomes evident and the time actual performance must begin.

TASK ELEMENT: A subdivision of a task whose level of complexity is directly subordinate to the task itself. A task element is a distinct and constituent part of a task, constituting a logical and necessary step in the performance of the task. Performing a task element does not result in a completed work action or a measurable work product. It is the smallest unit of work contained in the job that is considered in job task analysis. Sometimes called subtask (Air Force usage).

TASK INVENTORY: See JOB TASK INVENTORY (QUESTIONNAIRE).

TASK STATEMENT: The statement of a task is composed of three basic elements: (1) a specific action verb, descriptive of what is done; (2) a brief identification of what is being acted upon—the object of the action verb; and (3) whatever qualifying phrases that may be needed to clearly distinguish the task from related or similar activities, to limit and define the scope of concern, or to communicate unambiguously what task it is.

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TAXONOMY: A taxonomy involves the systematic differentiation, ordering, relating, and naming of type groups within a subject field. In these terms, the classification of naval ships is a kind of taxonomy in which ships are grouped by class, type, and overall purpose.

EXAMPLE: 2200 class, DD type, combatant purpose.

Taxonomy is a prerequisite for classification, that is, the organization of tasks, or of any subject matter, into groups requires the previous development of a sound logic and rationale for the organization. The grouping of task statements under duty headings in NOTAP task inventories is one example. As a second example, in developing a taxonomy of job analysis terms, job and task analysis data could be categorized by possible uses and levels of analysis. Thus, an analysis of an occupation for job design might be termed "occupational structure analysis." An analysis at the task level for instructional curriculum design might be termed "training task analysis."

TERMINAL LEARNING OBJECTIVE (TLO): Derived from job performance measures, TLOs are to be attained during training. TLOs are broken down into their component parts which are documented as learning objectives and which may be further divided into learning steps. Each TLO contains actions, conditions, and standards.

TLO: See TERMINAL LEARNING OBJECTIVE (TLO).

TRAINING TASK ANALYSIS: A detailed, highly specific task analysis performed by training activities to design and update instructional curriculums. Job task analysis computer printouts are used for assistance in the analysis process, resulting in an organized set of terminal, learning, and enabling objectives. See also JOB TASK ANALYSIS.

TRANSFER TASK: A task that can be characterized as possessing variability in its cues, elements, conditions, and standards. By definition, a transfer task can be accomplished/performed correctly in a variety of ways dependent upon the situation, the performer, and the conditions.

HANDBOOK FOR CONSTRUCTION OF TASK INVENTORIES

FOR NAVY ENLISTED RATINGS

APPENDIX B

DEFINITIONS FOR COMMON ACRONYMS

USED IN JOB TASK ANALYSIS
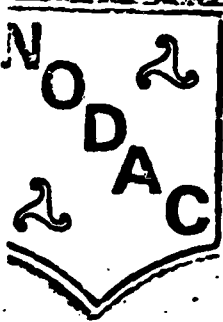
ADP	Automated Data Processing
AFHRL	Air Force Human Resources Laboratory
AFSC	Air Force Specialty Code
BUMED	Bureau of Medicine and Surgery
CNET	Chief of Naval Education and Training
CNETS	Chief of Naval Education and Training Support
CNO	Chief of Naval Operations
CNTT	Chief of Naval Technical Training
CODAP	Comprehensive Occupational Data Analysis Programs
CONUS	Continental United States
ECM	Enlisted Community Manager
EIC	Equipment Identification Code
IPD	Instructional Program Development
ISD	Instructional Systems Development (Definition 1); Instructional System Design (Definition 2)
ISOTAP	Interservice Occupational Task Analysis Program
JPA	Job Performance Aid
JPM	Job Performance Measure
KSA	Knowledges, Skills, and Abilities
MAPMIS	Manpower And Personnel Management Information System
MOS	Military Occupational Specialty (Army/Marine Corps)
MRC	Maintenance Requirement Card
NAMP	Naval Aircraft Maintenance Program
NAVAIRSYSCOM	Naval Air Systems Command
NAVEDTRAPRO-DEVCEN (PD)	Naval Education and Training Program Development Center (Program Development)
NAVMMACLANT	Navy Manpower and Material Analysis Control, Atlantic
NAVMMACPAC	Navy Manpower and Material Analysis Control, Pacific
NAVSEASYSCOM	Naval Sea Systems Command
NEC	Naval Enlisted Classification
NMPC	Naval Military Personnel Command
NOBC	Naval Officer Billet Classification
NODAC	Navy Occupational Development and Analysis Center
NOTAP	Navy Occupational Task Analysis Program
NPRDC	Navy Personnel Research and Development Center

O&I	Observation and Interview
OAI	Occupation Analysis Inventory
OCCSTDS	Occupational Standards
OCR	Optical Character Reader
OJT	On-the-Job Training
ONR	Office of Naval Research
OPSCAN	Optical Scan
OSR	Occupational Survey Report (Air Force)
PAQ	Position Analysis Questionnaire
PAR	Personnel Advancement Requirement
PMS	Planned Maintenance System (3M)
POI	Plan of Instruction
PQS	Personnel Qualification Standards
RTM	Rate Training Manual
SME	Subject Matter Expert (Navy usage)
	See also: SMS
SMS	Subject Matter Specialist (Air Force usage)
	See also: SME
TLO	Terminal Learning Objective
USAFOMC	U.S. Air Force Occupational Measurement Center

HANDBOOK FOR CONSTRUCTION OF TASK INVENTORIES

FOR NAVY ENLISTED RATINGS

APPENDIX C

A LIST OF

STANDARD NODAC ACTION VERBS

C-0
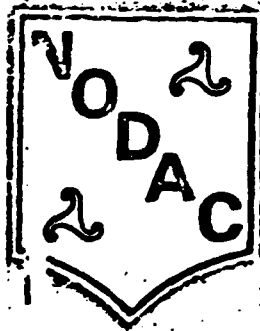
ACCEPT   RECEIVE WITH CONSENT; E.G., ACCEPT INTERNATIONAL
                      MAIL FOR TRANSMISSION.

ACCOMPANY   GO WITH; ESCORT A PERSON OR UNIT; E.G., ACCCMPANY
                      COMMANDER OF FOREIGN NAVAL COMMAND ON OPERATIONAL
                      COMBAT MISSION.

ACCOUNT FOR   REPORT ON; FURNISH A JUSTIFYING ANALYSIS OR
                      EXPLANATION; E.G., ACCOUNT FOR COMMON AVIATION
                      HANDTOOLS.

ACCUMULATE   AMASS; COLLECT OR GATHER; INCREASE IN AMOUNT
                      OR NUMBER, GROW.

ACKNOWLEDGE   RECOGNIZE AS TRUE OR PERTINENT; ADMIT OBLIGATICN;
                      REPORT RECEIPT OF (A LETTER, CHECK, ETC.); E.G.,
                      ACKNOWLEDGE RECEIPT OF AVIATION MATERIAL.

ACT   PERFORM A FUNCTION TO DO SOMETHING; EXERT ENERGY
                      OR FORCE; EMPLOY OR OPERATE; HAVE AN EFFECT.

ACT FOR OR AS   PERFORM IN LIEU OF OR IN SUBSTITUTE CAPACITY FCR
                      OPERATE FOR ANOTHER, AS IN ASSUMING RESPONS.BIL-
                      ITY AND AUTHORITY OF A SUPERIOR; E.G., ACT FOR
                      COMMANDER IN HIS ABSENCE.

ACTIVATE   MAKE ACTIVE; E.G., ACTIVATE STORAGE BATTERIES.

ADAPT   MAKE FIT, OFTEN BY MODIFYING.

ADHERE   COMPLY WITH, SUPPORT; E.G., ADHERE TO PRCGRAMM
                      STANDARDS.

ADJUST   CHANGE TO MATCH OR FIT REQUIREMENTS; ADAPT
                      OR CONFORM, SETTLE DIFFERENCES OR DISCREPANCIE

ADMINISTER   MANAGE OR DIRECT EXECUTION, CONDUCT OR APPLICA-
                      TION OF; PERFORM OFFICES OF AN ADMINISTRATOR;
                      E.G., ADMINISTER A NAVAL RECREATION PROGRAM.

ADOPT   ACCEPT INTO OR ACT IN ACCORDANCE WITH (A PLAN,
                      PRINCIPLE, ETC.).

ADVISE   GIVE ADVICE, COUNSEL, INFORMATION OR NOTICE TO
                      RECOMMEND COURSE OF ACTION (PARTICULARLY
                      APPLICABLE TO STAFF AND TECHNICAL FIELDS);
                      E.G., ADVISE A SUBORDINATE OF A PRCPER COURSE
                      OF ACTION.

AFFIRM   ASSERT TO BE TRUE OR CORRECT; CONFIRM, UPHCLD,
                      E.G., AFFIRM PROPERLY IMPOSED COURT-MARTIAL
                      SENTENCES.

AFFIX   ATTACH PHYSICALLY.

AGE   MATURE; MAKE OLD; CAUSE TO ALLOW TO STAND
UNTIL TRANSFORMATIONS HAVE TAKEN PLACE.

AID   HELP; ASSIST; E.G., AID PILOTS IN DETERMINATION
OF AIR ROUTES.

ALIGN   ADJUST, FORM, OR BRING TO A LINE.

ALLOCATE   PLAN AN APPORTIONMENT OR ALLOCATION OF FUNDS OR
MATERIALS.

ALTER   MAKE DIFFERENT; E.G., ALTER TROUSERS, ALTER
COMPASS HEADINGS.

AMPLIFY   MAKE LARGER OR GREATER; INCREASE THE AMPLITUDE
OF.

ANALYZE   STUDY PARTS, ELEMENTS, OR FACTORS OF A SITUATION
OR PROBLEM IN DETAIL TO DETERMINE COURSE OF ACT-
ION, SOLUTION, OR OUTCOME; EXAMINE CRITICALLY
FOR UNDERSTANDING THE ORGANIZATION OR NATURE OF;
E.G., ANALYZE MALFUNCTION OF SERVO AND COMPUTING
CIRCUITS.

ANNEAL   SUBJECT TO HIGH HEAT, WITH SUBSEQUENT COOLING,
FOR THE PURPOSE OF SOFTENING THOROUGHLY AND
RENDERING LESS BRITTLE; E.G., ANNEAL GRAVERS,
SPRINGS AND SCREWDRIVER BITS.

ANNOTATE   FURNISH WITH CRITICAL OR EXPLANATORY NOTES; E.
ANNOTATE A TEXT.

ANNOUNCE   MAKE KNOWN PUBLICLY; PROCLAIM, GIVE NOTICE OF.

ANSWER   ACT OR REPLY IN RESPONSE TO AN ACTION PERFORME
ELSEWHERE OR BY ANOTHER; E.G., ANSWER VERBAL
INQUIRIES CONCERNING ROUTINE MAIL SERVICE.

APPLY   PLACE IN CONTACT WITH; PUT TO USE; EMPLOY; E.
APPLY PAINT TO A PREPARED SURFACE.

APPRAISE   ESTIMATE CAPABILITY OF, OR VALUE OF; FORM AN
OPINION ABOUT; JUDGE QUALITY OF; E.G., APPRAI
ENEMY'S POTENTIAL; APPRAISE THE TACTICAL SIT-
UATION; APPRAISE EFFECTS OF NUCLEAR DETONATIO
TEACH, INFORM; NOTIFY; E.G., APPRAISE COMMAND
OFFICER OF STATUS OF PROJECTS.

APPROVE   GIVE OFFICIAL SANCTION TO; REACT FAVORABLY TO-
WARD; ENDORSE; SUCH AS REPORTS OR REPLIES; E.G.,
APPROVE PROPOSED PLANS AND PROCEDURES.

ARM   EQUIP WITH WEAPONS; PROVIDE OR SET THE FUSE
OF INITIATING OR DESTRUCTIVE ELEMENT SO THAT
IT CAN BE EXPLODED.

ARRANGE

PUT IN ORDER; SORT SYSTEMATICALLY; MAKE PREPARA-
TIONS FOR (SUCH AS MEETINGS ETC.); E.G., ARRANGE
A COURTROOM FOR TRIAL; ADAPT (A MUSICAL COMPOSI-
TION) BY SCORING FOR VOICES OR INSTRUMENTS OTHER
THAN THOSE FOR WHICH ORIGINALLY WRITTEN.

ASCERTAIN

FIND OUT OR LEARN FROM APPROPRIATE SOURCES,
EXAMINATIONS OR TESTS.

ASSEMBLE

GATHER TOGETHER INTO A GROUP, OR INTO A UNIT;
COLLECT; E.G., ASSEMBLE USAGE AND INVENTORY DAT ;
PUT OR FIT TOGETHER; PUT TOGETHER THE PARTS OF.

ASSESS

DETERMINE THE IMPORTANCE OF; ESTIMATE VALUE OF.

ASSIGN

APPOINT; PRESCRIBE A COURSE OF ACTION; SPECIFY,
SELECT OR DESIGNATE; E.G., ASSIGN
RESPONSIBILITIES TO CIC PERSONNEL.

ASSIST

AID, HELP, SUPPORT; E.G., ASSIST DENTAL OFFICER
WHILE TREATING PATIENTS.

ASSUME

TAKE ON; UNDERTAKE; ACCEPT (RESPONSIBILITY,
ETC.); E.G., ASSUME RESPONSIBILITY FOR
ADMINISTRATION OF CASUAL PERSONNEL.

ASSURE

INSURE; E.G., INSURE CONTINUOUS NO-BREAKPOWER
SUPPLY FROM DIESEL-DRIVEN MOTOR.

ATTACH

CONNECT; FASTEN.

ATTACK

SET UPON FORCEFULLY, VIOLENTLY, HOSTILELY, OR
AGGRESSIVELY WITH OR WITHOUT A WEAPON.

ATTEND

BE PRESENT AT AND POSSIBLY PARTICIPATE IN
(CONFERENCES, CEREMONIES, ETC.).

AUDIT

EXAMINE WITH INTENT TO VERIFY.

AUGMENT

INCREASE OR INTENSIFY, AS IN SIZE, DEGREE, OR
EFFECT.

AUTHENTICATE

RENDER AUTHENTIC; GIVE AUTHORITY TC, BY THE
PROOF, ATTESTATION OR FORMALITIES REQUIRED BY
LAW; PROVE AUTHENTIC, CONFIRM, VERIFY AS TO TH
GENUINENESS; E.G., AUTHENTICATE ON A CIC RADIO
TELEPHONE CIRCUIT; AUTHENTICATE ON A FLEET CW
CIRCUIT.

AUTHORIZE

PERMIT, EMPOWER, ESTABLISH BY AUTHORITY OF POSI-
TION.

AWARD

GIVE; GRANT; ADJUDGE; E.G., AWARD REPAIR
CONTRACTS.

BAKE

HARDEN, DRY BY SUBJECTING TO HEAT.

BALANCE

WEIGH IN A BALANCE; COMPARE IN RELATIVE FORCE,
IMPORTANCE, OR VALUE; SETTLE AND ADJUST (AS AN
ACCOUNT); COMPUTE THE DIFFERENCE (AS AN
EQUATION); E.G., BALANCE EARTHWORK QUANTITIES.

BALLAST

STEADY OR EQUIP WITH OR AS IF WITH BALLAST (A
HEAVY SUBSTANCE USED TO IMPROVE STABILITY).

BARRICADE

BLOCK OFF, PREVENT ACCESS TO.

BATHE

IMMERSE IN WATER, SOME OTHER LIQUID, OR STREAM
AS FOR CLEANING OR TREATING.

BATTEN DOWN

COVER AND FASTEN DOWN; CLOSE A HATCH OR WATER-
TIGHT DOOR.

BEACH

GROUND (A BOAT) ONTO A BEACH, DRIVE (A BOAT)
ASHORE.

BELAY

CANCEL AN ORDER; STOP; FIRMLY SECURE A LINE.

BELT

PUT AMMUNITION IN A BELT FOR SUBSEQUENT ARMING
OF AN AUTOMATIC WEAPON; E.G., BELT AMMUNITION.

BEND

TURN OR INCLINE IN A PARTICULAR DIRECTON.

BEND ON

SECURE ONE THING TO ANOTHER, AS BEND A FLAG ON
A HALYARD.

BIAS

APPLY A SLIGHT POSITIVE OR NEGATIVE VOLTAGE TO
INSERT A STEADY VOLTAGE IN SERIES WITH AN
ELEMENT OF AN ELECTRONIC DEVICE, E.G., VACUUM
TUBE OR TRANSISTOR.

BLAST

USE EXPLOSIVE TO DEMOLISH OR CLEAR.

BLEED

DRAIN OR EMPTY LIQUID, GAS, OR OTHER CONTENTS
THAT WILL RUN OUT, AS FROM A STEAM CYLINDER,
OXYGEN TANK, OR LEADING BUOY; E.G., DRAIN OFF
LOW PRESSURE STEAM FROM ANY OF THE STAGES CF
TURBINE; DRAIN A HYDRAULIC DEPTH CHARGE RELEAS
MECHANISM.

BLEND

MIX OR INTERMINGLE SMOOTHLY AND INSEPARABLY;
AIRCRAFT MAINTENANCE FIELD: APPLY JEWELER'S ROUGH
OR AN EMERY CLOTH, FOR EXAMPLE, TO THE SURFACE CF
BLADES INSIDE AIRCRAFT ENGINES TO REMOVE FOREIGN
PARTICLES IMPLANTED ON THE BLADES; E.G., BLEND
POWER TURBINE BLADES OR BLEND COMPRESSOR RCTOR
BLADES.

BLOCK OPEN

OBSTRUCT SO AS TO KEEP FROM CLOSING.

BLOW DOWN   CLEAR OF ANY OBSTRUCTING MATERIAL SUCH AS DIRT
                               OR SCALE; E.G., BLOW DOWN GAGE GLASSES.

BOND   LAP FOR SOLIDITY OF CONSTRUCTION; CAUSE TO
                               ADHERE FIRMLY.

BOOK   SCHEDULE ENGAGEMENTS FOR; E.G., BOOK ALL TYPES
                               OF FILMS.

BORE   MAKE A HOLE WITH OR AS IF WITH A ROTARY TOOL.

BORESIGHT   ESTABLISH, THROUGH USE OF A BORESIGHT BOARD
                               OR SCREEN AND A TELESCOPIC BORESIGHT KIT, A SPEC-
                               IFIC RELATIONSHIP BETWEEN THE AIRCRAFT ARMAMENT
                               DATUM LINE, ANTENNA RF AND OPTICAL AXES, OPT-
                               ICAL SIGHT UNIT, AND LAUNCHERS.
                               ALIGN GUN OR MISSLE SYSTEM TO ASSOCIATED FIRE
                               CONTROL SYSTEM.

BOX   PACK IN A PROTECTIVE CARTON FOR SHIPPING OR
                               STORING.

BRACE   REINFORCE OR MAKE STRONGER BY BRACES, SHORES,
                               UNDERPILINGS.

BRAKE   SLOW OR STOP.

BRAZE   SOLDER WITH A RELATIVELY INFUSIBLE ALLOY.

BREAK   INJURE SO AS TO CRACK OR DIVIDE; INJURE SO AS
                               TO RENDER USELESS. UNFURL A FLAG WITH A QUICK
                               MOTION.

BREAK OUT   TAKE DOWN FROM OR OUT OF A CUSTOMARY PLACE OF
                               STORAGE FOR AN OPERATIONAL OR MAINTENANCE
                               PURPOSE; E.G., BREAK OUT A SOUND-POWERED PHONE
                               HEADSET.

BRIEF   PRESENT THE PERTINENT FACTS;
                               E.G., BRIEF PILOTS BEFORE A MISSION.

BRUSH   APPLY A BRUSH TO; E.G., BRUSH AND ROLL ON PAINT

BUILD   CONSTRUCT BY ASSEMBLING AND COMBINING PARTS;
                               FORM OR CONSTRUCT A PLAN, SYSTEM OF THOUGHT;
                               ESTABLISH, INCREASE, AND STRENGTHEN.

BUILD UP   FORM BY ORDERING AND UNITING MATERIALS BY GRAD-
                               UAL MEANS INTO A COMPOSITE WHOLE; IMPROVE THE
                               STATUS OF; INCREASE; ENLARGE.
                               REPLACE WORN MATERIAL IN ORDER TO RETURN (AN
                               ARTICLE) TO ORIGINAL DIMENSION OR THICKNESS.

BURN   CONSUME BY FIRE.

BURN OUT   REMOVE MOISTURE AND ELIMINATE WAX OR PLASTIC
                       USED IN DENTURE PATTERN BY APPLICATION OF HEAT;
                       E.G., BURN OUT METAL FRAMEWORKS.

CAGE   PUT OR CONFINE IN, OR AS IN, A CAGE OR POSI-
                       TION, AS A GYRO.

CALCULATE   DETERMINE BY MATHEMATICAL PROCESSES-IMPLIES HIGH-
                       LY INTRICATE PROCESSES AS AGAINST COMPUTES WHICH
                       IMPLIES SIMPLE ARITHMETICAL PROCESSES AND EXACT
                       RESULTS; FORECAST CONSEQUENCES OR RESULTS, AS IN
                       TAKING RISKS.

CALIBRATE   ASCERTAIN THE CALIBER OF, DETERMINE, RECTIFY, OR
                       MARK THE GRADATIONS OF; ADJUST IN ACCORDANCE WITH
                       A PREVIOUSLY DEFINED STANDARD; E.G., CALIBRATE
                       PASSIVE AND ACTIVE SONAR EQUIPMENT.

CALK   TIGHTEN (A JOINT FORMED BY OVERLAPPING PLATES)
                       BY DRIVING THE EDGE OF ONE PLATE INTO THE SURFACE
                       OF THE OTHER; HENCE, MAKE TIGHT AGAINST LEAKAGE
                       BY ANY SIMILAR MEANS, SUCH AS PACKING WITH
                       OAKUM.

CALL   AWAKEN AS THE ONCOMING WATCH; ATTEMPT TO ES-
                       TABLISH COMMUNICATION WITH.

CANCEL   DESTROY; DEFACE; MARK FOR DELETION.

CANNIBALIZE   TAKE FROM ONE, AS PART FROM A MACHINE, AND ADD
                       IT TO ANOTHER.

CAP   PROVIDE OR COVER WITH OR AS WITH A CAP; COMPL
                       SURPASS WITH SOMETHING BETTER.

CAPTION   ENTITLE; PLACE AN IDENTIFICATION ON.

CARE   BE CONCERNED OR SOLICITOUS; MAKE PROVISIONS
                       OR LOOK OUT FOR.

CARRY OUT   TAKE ACTION ON BASIS OF ORDERS, REGULATIONS,
                       DIRECTIVES, ESTABLISHED POLICIES, APPROVED
                       PLANS, ETC.

CARVE   CUT (A SOLID MATERIAL) SO AS TO FORM SOMETHIN
                       E.G., CUT MEAT FOR SERVING.

CASH   PAY OR OBTAIN CASH FOR.

CAST LOOSE   REMOVE RESTRAINT(S); LET GO, AS LET GO A LINE.

CAST OFF   THROW OFF, LET GO, UNFURL.

CATALOGUE   MAKE A LIST, INSERT IN A LIST; E.G., CATALOGUE

NEGATIVE AND POSITIVE PRINTS FOR FILING.

CEMENT   BIND TOGETHER USING CENTERING MACHINE (OPTICAL)

CENSOR   EXAMINE CORRESPONDENCE, NEWS DISPATCHES,
                    SPEECHES, ETC., IN ORDER TO SUPPRESS OR DELETE
                    WHATEVER, IF COMMUNICATED, MIGHT AID THE ENEMY JR
                    INJURE MILITARY OR CIVILIAN DISCIPLINE OR MORAL::.

CENTER   PLACE IN OR ON A CENTER; COLLECT AROUND A
                    CENTER.

CERTIFY   CONFIRM FORMALLY IN WRITING AS MEETING A
                    STANDARD.
                    ATTEST AUTHORITATIVELY AS TRUE, ACCURATE, AS REP-
                    RESENTED OR AS MEETING A STANDARD; TESTIFY TO IN
                    WRITING; E.G., CERTIFY TIME AND LEAVE RECORDS;
                    CERTIFY PILOTS AS QUALIFIED FOR PARTICULAR AIR
                    CRAFT.

CHANGE   ALTER; REPLACE WITH ANOTHER; TRANSFORM;
                    SUBSTITUTE; E.G., CHANGE AIRCRAFT BATTERIES.

CHARGE   LAY OR PUT A LOAD ON OR IN; PLACE A CHARGE IN OR
                    ON; E.G., CHARGE A TORPEDO AIR FLASK.

CHART   DRAW, OR EXHIBIT ON, A CHART, MAP, OR GRAPH;
                    E.G., CHART DENTAL CONDITIONS; CHART MINE FIELDS
                    AND SWEPT CHANNELS.

CHECK   INSPECT FOR SATISFACTORY CONDITION, ACCURACY,
                    SAFETY, OR PERFORMANCE; COMPARE WITH A SOURCE,
                    ORIGINAL, OR AUTHORITY TO VERIFY EXACTNESS; E.
                    CHECK OVERHAUL SCHEDULES FOR CONFORMITY WITH
                    MAINTENANCE PROGRAM. STOP OR ARREST THE MOTION
                    OF SUDDENLY OR FORCIBLY, TO RESTRAIN OR HOLD
                    RESTRAINT OR CONTROL; INVESTIGATE OR VERIFY
                    AS TO CORRECTNESS.

CHOCK   FURNISH WITH OR SECURE BY A CHOCK OR CHOCKS.

CIRCULATE   PASS FROM PERSON-TO-PERSON OR PLACE-TO-PLACE;
                    DISTRIBUTE; FLOW WITHOUT OBSTRUCTION.

CLARIFY   MAKE MORE READILY UNDERSTANDABLE; INTERPRET.

CLASSIFY   PLACE IN CATEGORIES, AS PERSONNEL, DUTY
                    POSITIONS, SUPPLIES, ETC.; E.G., CLASSIFY
                    INTERCEPTED ELECTRO-MAGNETIC RADIATIONS, SUCH
                    RADAR, NAVIGATIONAL, JAMMING, OR MISSILE CONT OI
                    SIGNALS.

CLEAN   RID OF DIRT, IMPURITIES, OR EXTRANEOUS MATTER

CLEAR   FREE FROM POLLUTION, OR CLOUDINESS; FREE FROM

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OBSTRUCTION; E.G., CLEAR FOGGED AREAS OF
NEGATIVES; CLEAR AND RESTORE FAULTY AUTOMATIC
TELEPHONE EQUIPMENT TO NORMAL OPERATIONS.

CLIMB   ASCEND.

CLIP   CUT, OR CUT-OFF OR OUT; TRIM BY CUTTING;
               HOLD OR FASTEN TOGETHER.

CLOSE   STOP OR FILL UP, AS AN OPENING, SHUT; BRING TO AN
               END, CLOSE OUT; UNITE; CONSOLIDATE.

COAT   COVER OR SPREAD WITH A FINISHING, PROTECTING,
               OR ENCLOSING LAYER.

CODE   PUT IN OR INTO REPRESENTATIVE FORMS OR
               SYMBOLS.

COIL   LAY DOWN LINE IN CIRCULAR TURNS, USUALLY ONE
               TURN ATOP THE OTHER.

COLLATE   EXAMINE AND COMPARE CRITICALLY TO VERIFY
               ARRANGEMENT, PARTS, ETC.; E.G., COLLATE A
               SUMMARY REPORT PREPARED IN SEPARATE PORTIONS
               BY SEVERAL INDIVIDUALS.

COLLECT   GATHER TOGETHER, ASSEMBLE, ACCUMULATE, COMPILE,
               CALL FOR AND/OR RECEIVE PAYMENT; E.G., COLLECT
               DATA ON STRUCTURE AND FUNCTIONINGS OF NAVAL
               ORGANIZATIONS.

COLLET   SET IN, OR FURNISH WITH, A COLLET (I.E., A META
               BAND, AS IN AN ANEROID BAROMETER).

COLLIMATE   MAKE PARALLEL (AS RAYS OF LIGHT); ADJUST THE L
               OF SIGHT OF (A LEVEL OR TRANSIT); E.G., COLLIMA
               BASIC OPTICAL INSTRUMENTS.

COMMAND   DIRECT AUTHORITATIVELY, ORDER; E.G., COMMAND A
               SQUAD IN CLOSE-ORDER DRILL; COMMAND A DESTROYE
               SQUADRON.

COMMUNICATE   GIVE, OR GIVE AND RECEIVE, INFORMATION, SIGNAL
               OR MESSAGES IN ANY WAY, AS BY SPEECH, GESTURES
               WRITING, ETC.

COMPACT   PACK TOGETHER BY VIBRATION OR RODDING.

COMPARE   EXAMINE FOR LIKENESS AND/OR DIFFERENCES; E.G.,
               COMPARE PERFORMANCE WITH ESTABLISHED STANDARDS;
               COMPARE OPERATING COSTS OF DIFFERENT SHOPS.

COMPENSATE   COUNTERBALANCE, MAKE UP FOR; GIVEN AN EQUIVA-
               LENT TO; ADJUST, MAKE EQUAL RETURN TO, USUALLY
               WITH THE PREPOSITION "FOR"; E.G., COMPENSATE A

MAGNETIC COMPASS.

COMPILE   COLLECT INTO PROPER OR DESIGNATED FORM; E.G.,
                   COMPILE DATA INTO A REPORT; COMPOSE OUT OF
   ...   MATERIALS FROM OTHER DOCUMENTS, SUCH AS SUMMARY
                   REPORTS AND STATISTICAL SUMMARIES, FROM SEVERAL
                   INDIVIDUAL PAPERS.

COMPLETE   PROVIDE WITH LACKING PARTS OR INFORMATION; E.G.,
                   COMPLETE CASUALTY ANALYSIS INSPECTION SHEETS.

COMPLY   CONFORM OR ADAPT ONE'S ACTIONS IN ACCORDANCE
                   WITH GUIDELINES, COMMAND OR A RULE, OR OF
                   NECESSITY.

COMPOSE   FORM IN COMBINATION, MAKE UP, CONSTITUTE; PUT
                   TOGETHER, CREATE, AS A LETTER OR MUSICAL WORK.

COMPOUND   MAKE AN AGGREGATE OF, PUT TOGETHER, MIX OR
                   COMBINE ELEMENTS OF; E.G., COMPOUND INTEREST
                   ON THE SUM OF A PRINCIPAL.

COMPRESS   PRESS TOGETHER; FORCE INTO LESS SPACE.

COMPUTE   DETERMINE BY CALCULATON; RECKON OR COUNT; TAKE
                   ACCOUNT OF, MAKE UP A COUNT; E.G., COMPUTE LEAV
                   BALANCES AND LEAVE CREDITS.

CONDENSE   MAKE MORE DENSE OR COMPACT; REDUCE THE VOLUME
                   OR EXTENT OF.

CONDUCT   LEAD, ESCORT, CONTROL; DIRECT, CARRY ON; E.G.,
                   CONDUCT A TORPEDO FIRING SYSTEM TRANSMISSION
                   CHECK; CONDUCT PHYSICAL EXAMINATIONS; CONDUCT A
                   MUSICAL OVERTURE. ACT AS LEADER OR DIRECTOR;
                   CONDUCT AN ORCHESTRA; CARRY ON AS AN EXPERIMENT
                   CARRY ON OR OUT, USUALLY FROM A POSITION OF
                   COMMAND OR CONTROL.

CONFER   CONSULT; COMPARE VIEWS, MEET FOR DISCUSSIONS;
                   E.G., CONFER WITH REPRESENTATIVES OF PRIVATE
                   CONTRACTORS CONCERNING DESIGN PROBLEMS.

CONFIRM   MAKE FIRM OR FIRMER, AS IN RECORDING VERBAL ORD
                   INTO WRITTEN FORM; VERIFY AND MAKE VALID BY
                   FORMAL ASSENT.

CONNECT   JOIN OR FASTEN TOGETHER, USUALLY BY SOMETHING
                   INTERVENING; PLACE OR ESTABLISH IN RELATIONSHI
                   E.G., CONNECT PORTABLE PUMPS IN TANDEM.

CONSOLIDATE   UNITE INTO ONE MASS OR BODY; BRING TOGETHER IN
                   CLOSE UNION.

CONSTRICT   DRAW OR PRESS IN; CAUSE TO CONTRACT OR SHRINK;

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COMPRESS.

CONSTRUCT   PUT TOGETHER SYSTEMATICALLY; BUILD, DEVISE, AS A
             BRIDGE, THEORY, TRIANGLE, ETC.; E.G., CONSTRUCT
             TESTS FOR MEASURING ACHIEVEMENT, CONSTRUCT BENCH
             AND FLOOR MOLDS.

CONSULT   CONFER WITH ANOTHER TO OBTAIN FACTS, ADVICE,
             OPINIONS, ETC.; E.G., CONSULT WITH CARDIO-
             VASCULAR DISEASE SPECIALIST.

CONTOUR   SHAPE TO FIT AN OUTLINE OF AN ESPECIALLY CURVING
             OR IRREGULAR FORM OR FIGURE.

CONTRACT   ENTER OFFICIALLY INTO A FORMAL AGREEMENT TO
             OBTAIN OR PROVIDE MATERIAL, SUPPLIES, EQUIPMENT,
             AND/OR SERVICES; E.G., CONTRACT FOR AVIATION
             EQUIPMENT; GET SMALLER; SHRINKS.

CONTRIBUTE   GIVE OR SUPPLY IN PART, ALONG WITH OTHERS, AS IN-
             FORMATION OR ADVICE, A SECTION OF A PLAN, ETC.

CONTROL   CHECK OR REGULATE; KEEP WITHIN LIMITS; EXERCISE
             DIRECTING, GUIDING, OR RESTRAINING POWER OVER;
             E.G.; CONTROL SITE DEPLOYMENT OF MATERIALS AND
             EQUIPMENT.

CONVERT   CHANGE, TRANSFORM, TURN, EXCHANGE FOR SOMETHING
             EQUAL IN VALUE (A SECURITY, CURRENCY, ETC.);
             E.G., CONVERT POINTS INTO GRID COORDINATES.

COOPERATE   ACT OR OPERATE JOINTLY WITH ANOTHER OR OTHERS;
             IMPLIES VOLUNTARY ACTION RATHER THAN UNDER ORDE
             OF IMPLICIT DIRECTION.

COORDINATE   BRING INTO COMMON ACTION WITH OTHERS, GENERALLY
             WITH EQUAL RANKS, NOT SUBORDINATES, AS IN COORD
             NATING ATTACKS WITH ADJACENT UNITS OR SUPPORTIN
             UNITS, OR AS IN COORDINATING STAFF FUNCTIONS TO
             OBTAIN A RESULT THAT REQUIRES ACTION ON THE PA
             OF SEVERAL STAFF SECTIONS;
             E.G., COORDINATE REPAIR ACTIVITIES
             BETWEEN SHIP AND SHIPYARD.

COPY   DUPLICATE; IMITATE; ANNOTATE IN ACCORDANCE WIT
             STANDARD MUSIC EDITORIAL PRACTICES.

CORRECT   MAKE OR SET RIGHT; ALTER OR ADJUST TO BRING TO A
             REQUIRED CONDITION; RECTIFY; INDICATE ERRORS,
             FAULTS, DISCREPANCIES TO BE AMENDED.

CORRELATE   ESTABLISH A MUTUAL OR RECIPROCAL RELATION
             BETWEEN; E.G., CORRELATE REQUIREMENTS AND
             RESOURCES.

COUNSEL

ADVISE, GIVE ADVICE TO; RECOMMEND, AS ACTION.

COUNTER

ACT, OR MOVE AGAINST; OPPOSE, IN THE SENSE OF
OPPOSITION TO THE PREVIOUS ACTION OF A PARTY.

COUNTERSINK

ENLARGE THE TOP PART OF A HOLE (IN METAL, WOOD,
ETC.) SO THAT THE HEAD OF A BOLT, SCREW, ETC.,
WILL FIT FLUSH WITH OR BELOW THE SURFACE; SINK
(HEAD OF BOLT, SCREW, ETC.) INTO SUCH A HOLE.

COUPLE

JOIN IN A PAIR; UNITE.

COVER

PLACE SOMETHING OVER OR UPON, AS FOR PROTECT-
ION OR CONCEALMENT.

CRANK

ROTATE BY MEANS OF A CRANK; START AN ENGINE.

CRATE

PACK IN A PROTECTIVE CASE FOR SHIPPING.

CREATE

PRODUCE THROUGH IMAGINATIVE SKILLS;
E.G., CREATE 'INHOUSE' DATA BASE.

CRIMP

PRESS INTO SMALL REGULAR FOLDS; MAKE WAVY,
BENT, OR WARPED; FORM INTO A DESIRED SHAPE;
APPLY PRESSURE BY INSERTING FOLD WITH TOOL.

CRITIQUE

CRITICIZE; REVIEW, COMMENT ON AN EXERCISE
COURSE, PROGRAM, ETC.

CROP

CUT OFF THE TOPS OR ENDS OF; BITE OFF, CUT SHORT
E.G., CROP PICTURES FOR NEWSPAPER REPRODUCTION.

CURE

TREAT TO PREVENT SUDDEN LOSS OF MOISTURE FROM
CONCRETE BY USING WATER, WET SAND, OR STRAW;
PROVIDE MEDICAL APPLICATION; AGE FOOD.

CUT

SHAPE BY GRINDING; SHEAR OR HOLLOW OUT; PERFORM
THE OPERATION OF DIVIDING, SEVERING; INCISING,
INTERSECTION; E.G., CUT METAL; CUT HAIR.

CUT IN

CONNECT A MECHANICAL APPARATUS INTO AN ELECTRIC
CIRCUIT SO AS TO PERMIT OPERATION; E.G., CUT IN
AFTERBURNERS, CUT IN SUPERHEATERS.

DE-ARM

REMOVE A WEAPON OR SYSTEM FROM A STATE OF
READINESS TO EXPLODE OR ACTUATE.

DE-ENERGIZE

REMOVE ENERGY FROM.

DE-ICE

FREE OR KEEP FREE OF ICE.

DEACTIVATE

CAUSE TO BE INACTIVE; END THE EFFECTIVENESS OF.

DEBRIEF

INTERROGATE IN ORDER TO OBTAIN USEFUL INFORMATION
FROM (A PILOT, EMISSARY, ETC.) CONCERNING A MIS-

SION JUST COMPLETED; INSTRUCT NOT TO RELEASE ANY
CLASSIFIED INFORMATION AFTER RELEASE FROM A SEN-
SITIVE POSITION; E.G., DEBRIEF PILOTS AFTER A
FLIGHT.

DEBUG — CORRECT A DEFECT OR IMPERFECTION, AS IN A
MECHANICAL DEVICE, A NEW AIRPLANE, OR A COMPUTER
PROGRAM.

DECIDE — REACH A CONCLUSION; MAKE UP ONE'S MIND AS TO AN
ACTION, COURSE, OR JUDGMENT; E.G., DECIDE
APPLICABLE LAW.

DECODE — CONVERT FROM CODE INTO ORDINARY LANGUAGE.

DECONTAMINATE — RID OF CONTAMINATION.

DECREASE — DIMINISH, OR CAUSE TO DIMINISH, IN EXTENT,
QUANTITY, STRENGTH, ETC.; MAKE LESS.

DEFEAT — OVERCOME IN A CONTEST, BATTLE, ETC; VANQUISH.

DEFER — PUT OFF (ACTION, CONSIDERATION ETC) TO A
FUTURE TIME.

DEFINE — DETERMINE OR SET DOWN THE BOUNDARIES OF, SET DO
OR SHOW THE PRECISE OUTLINES OF; DETERMINE AN
STATE THE LIMITS AND NATURE OF; DESCRIBE EXAC
GIVEN THE DISTINGUISHING CHARACTERISTICS OF;
STATE OR EXPLAIN THE MEANING OF; E.G., DEFIN
COMMMON ELECTRIC AND ELECTRICAL TERMS.

DEFLASK — REMOVE (AS A DENTURE) FROM A FLASK AFTER PRO
ING.

DEFUEL — REMOVE FUEL FROM.

DEGARBLE — CORRECT ERRORS IN ENCIPHERMENT, TRANSMISSICN,
RECEPTION OF A MESSAGE.

DEGAUSS — NEUTRALIZE OR REDUCE THE MAGNETIC FIELD SUR-
ROUNDING A FERROUS OBJECT; E.G., DEGAUSS A S
NEUTRALIZE MAGNETIC TAPE RECORDINGS.

DEGREASE — REMOVE GREASE FROM.

DEHYDRATE — REMOVE WATER FROM; REMOVE HYDROGEN AND OXYGEN
FROM IN THE PROPORTION IN WHICH THEY FORM WATE.

DELEGATE — APPOINT AS A DELEGATE; ENTRUST AUTHORITY TO A
PERSON ACTING AS ONE'S AGENT OR REPRESENTATIVE;
E.G., DELEGATE AUTHORITY TC CONTRACT FOR EQUIP-
MENT.

DELINEATE — TRACE THE OUTLINE OF, SKETCH OUT; DESCRIBE;

E.G., DELINEATE CARTOGRAPHIC DATA, DELINEATE THE
TOPOGRAPHY OF AERIAL PHOTOS.

DELIVER
TRANSFER (TO); DISTRIBUTE; E.G., DELIVER CARGO
TO RAILHEADS AND TRUCKING DOCKS.

DEMAGNETIZE
REMOVE MAGNETIC PROPERTIES.

DEMILITARIZE
TAKE AWAY THE MILITARY CHARACTER; E.G.,
DEMILITARIZE USABLE MATERIAL AND SCRAP.

DEMOLISH
DESTROY; E.G., DESTROY UNDERWATER OBSTACLES.

DEMONSTRATE
GIVE EVIDENCE OF, DISPLAY; SHOW WITH THE INTENT
OF PROVING; EXPLAIN OR ILLUSTRATE; E.G.,
DEMONSTRATE EFFECT OF RUDDER ON THE MOTION OF A
VESSEL.

DEPICT
REPRESENT BY A PICTURE; PORTRAY IN WORDS.

DEPLOY
ARRANGE, PLACE, OR MOVE STRATEGICALLY OR AP-
PROPRIATELY.

DEPRESERVE
REMOVE FROM A STATE OF PRESERVATION.

DERIVE
RECEIVE OR OBTAIN FROM A SOURCE OR ORIGIN.

DESCRIBE
TELL OR WRITE ABOUT; GIVE A DETAILED ACCOUNT OF;
E.G., DESCRIBE EARLY SYMPTOMS OF INJURY TO
PERSONNEL BY CHEMICAL WARFARE AGENTS.

DESIGN
PLAN, SKETCH A PATTERN OR OUTLINE FOR;
E.G., DESIGN CARDS AND REPORT FORMS; CONTRIVE.

DESTROY
RUIN THE STRUCTURE, ORGANIC EXISTENCE, OR CON-
DITION OF; PUT AN END TO; RENDER INEFFECTIVE
OR USELESS.

DETAIL
FURNISH WITH THE SMALLER ELEMENTS OF DESIGN OR
FINISH; E.G., DETAIL A DRAWING; APPOINT OR ASSIG
FOR SOME PARTICULAR DUTY.

DETECT
DISCOVER THE PRESENCE OR EXISTENCE OF SOMETHING
PREVIOUSLY HIDDEN OR UNCLEAR; E.G., DETECT
CHEMICAL WARFARE AGENTS.

DETERMINE
SET BOUNDS OR LIMITS TO, FIX CONCLUSIVELY OR
AUTHORITATIVELY, COME TO A DECISION CONCERNING,
AS THE RESULT OF INVESTIGATION, REASONING, ETC.;
OBTAIN DEFINITE AND FIRST HAND KNOWLEDGE OF;
E.G., DETERMINE ONE'S POSITION AT SEA BY PLOTTING
A CROSS BEARING ON TWO OR MORE REFERENCES.

DETONATE
EXPLODE; E.G., DETONATE EXPLOSIVES.

DEVELOP

UNFOLD MORE COMPLETELY, FORM OR EXPAND BY A PROCESS OF GROWTH; MAKE MORE AVAILABLE OR USABLE; TREAT FILMS OR PLATES TO MAKE A PICTURE VISIBLE; E.G., DEVELOP PATTERNS AND TEMPLATES FOR METAL FABRICATION; DEVELOP PHOTOGRAPHIC PRINTS.

DEVISE

CONTRIVE; FORM NEW METHODS OR POSSIBILITIES OF. IMPLIES USING INGENUITY UNDER DIFFICULT CIRCUM-STANCES WHEN REGULAR TECHNICAL ASSISTANCE OR STANDARD MATERIALS ARE NOT AVAILABLE; E.G., DEVISE STATUS REPORTING SYSTEMS.

DIAGNOSE

RECOGNIZE, ANALYZE AND IDENTIFY (USUALLY A DISEASE, BUT IN MILITARY PARLANCE ANY CONDITION, STATE OR SITUATION) BY EXAMINATION AND OBSERVATION; E.G., DIAGNOSE IRREGULAR FLIGHT CHARACTERISTICS OF AIRCRAFT.

DIFFERENTIATE

PERCEIVE OR EXPRESS THE DIFFERENCE; DISTINGUISH BETWEEN.

DIGEST

CONDENSE FOR BREVITY; ABSTRACT; ARRANGE METHOD-ICALLY.

DIP

IMMERSE IN A LIQUID; E.G., DIP BEARINGS.

DIRECT

REGULATE THE ACTIVITIES OR COURSE OF; CONTROL; GUIDE; GIVE AN ORDER OR INSTRUCTION TO; E.G., DIRECT MEN IN DECK WATCH SECTION.

DISASSEMBLE

BREAK DOWN, TAKE APART; E.G., DISASSEMBLE A GENERATOR OF A DIFFERENTIAL PRESSURE GAGE.

DISCONNECT

SEVER THE CONNECTION OF OR BETWEEN.

DISENGAGE

RELEASE FROM SOMETHING THAT ENGAGES; RELEASE OR DETACH ONESELF.

DISINFECT

FREE FROM INFECTION, ESPECIALLY BY DESTROYING HARMFUL MICROORGANISMS; (BROADLY) CLEANSE.

DISMANTLE

TAKE APART; STRIP OF DRESS OR COVERING.

DISPATCH

SEND OFF QUICKLY OR PROMPTLY; E.G., DISPATCH INTRACENSORSHIP COMMUNICATIONS.

DISPENSE

DEAL OUT IN PORTIONS, DISTRIBUTE; E.G., DISPENS SIMPLE PHARMACEUTICAL PREPARATIONS.

DISPERSE

DRIVE OR SEND OFF IN VARIOUS DIRECTIONS; SCATTER; SPREAD WIDELY; DISSEMINATE.

DISPLAY

EXHIBIT; SHOW; SPREAD BEFORE A VIEW; E.G., DISPLAY RETENTION PUBLICITY.

DISPOSE   GET RID OF; DESTROY; E.G., DISPOSE OF OBSOLETE
                           FILES AND PUBLICATIONS.

DISSEMINATE   DIFFUSE, DISTRIBUTE, SPREAD BY DISPERSION, CIR-
                           CULATE; E.G., DISSEMINATE INTELLIGENCE DATA.

DISTINGUISH   RECOGNIZE OR DISCRIMINATE ONE THING FROM ANOTHE.;
                           PERCEIVE CLEARLY; E.G., DISTINGUISH BETWEEN RADAR
                           BLIPS.

DISTRIBUTE   DIVIDE, DEAL OUT, PORTION; ADMINISTER, DISPENSE;
                           E.G., DISTRIBUTE INCOMING MAIL TO SHIP DIVISIONS.

DIVE   SUBMERGE UNDERWATER; E.G., DIVE AND PERFORM
                           SALVAGE OPERATIONS.

DOCUMENT   FURNISH WITH EVIDENCE OR THE LIKE.

DOG   SECURE IN PLACE BY MEANS OF VARIOUS MECHANICAL
                           DEVICES, AS FOR HOLDING.

DON   ENVELOPE ONESELF; E.G., DON AVIATION-TYPE LIFE
                           VEST.

DOWNLOAD   REMOVE THE WEIGHT BORNE UP BY A STRUCTURE; E.G.,
                           DOWNLOAD A MISSILE FROM AN AIRCRAFT.

DRAFT   MAKE A PRELIMINARY SKETCH OR COMPOSITION OF;
                           E.G., DRAFT A NAVAL MESSAGE.

DRAIN   DRAW OFF LIQUID GRADUALLY OR COMPLETELY.

DRAW   CAUSE TO MOVE IN A PARTICULAR DIRECTION BY OR
                           BY A PULLING FORCE; CAUSE TO MOVE CONTINUOUSLY
                           TOWARD OR AFTER A FORCE APPLIED IN ADVANCE.
                           CREATE A LIKENESS OR PICTURE IN OUTLINES; SKETI

DRESS   DISPLAY FROM FLAGSTAFF AND FROM EACH MASTHEAD
                           LARGEST NATIONAL ENSIGN FURNISHED TO SHIP;
                           PREPARE BY SPECIAL PROCESS. AS ROUGH LUMBER;
                           APPLY DRESSING TO WOUND; CLOTHE; E.G., DRESS
                           DIVERS.

DRILL   TRAIN IN MILITARY OR PHYSICAL EXERCISES BY HAVIN
                           DO REPEATED PERFORMANCES; E.G., DRILL PERSONNEL
                           IN HANDLING EXPLOSIVES AND DETONATORS; PIERCE
                           OR BORE WITH A DRILL.

DRIVE   FORCE (A PASSAGE INTO OR THROUGH) BY PRESSING,
                           DIGGING ETC.; E.G., DRIVE SURVEY STAKES.

DRY   MAKE DRY; FREE FROM WATER OR LIQUID; E.G.,
                           DRY OPTICAL ASSEMBLY.

DUST   WIPE THE DUST FROM; SPRINKLE WITH A POWDER

OR DUST.

EASE OFF   EASE A LINE; SLACKEN WHEN TAUT.

EDGE   BORDER; SHARPEN; ADVANCE; E.G., EDGE LENSES.

EDIT   REVISE AND MAKE READY FOR PUBLICATION; ASSEMBLE
                      (AS A MOTION PICTURE) BY CUTTING AND REARRANGING;
                      PREPARE AN EDITION OF.

EFFECT   BRING TO PASS; ACCOMPLISH BY PERFORMANCE, MAKE
                      POSSIBLE BY EXECUTION; E.G., EFFECT AUTHORIZED
                      FIELD MODIFICATIONS OF EQUIPMENT.

ELEVATE   MOVE OR RAISE TO A HIGHER PLACE OR POSITION.

ELIMINATE   REMOVE OR GET RID OF; OMIT; EXCLUDE, EXPEL.

EMBALM   TREAT (A DEAD BODY) TO PROTECT FROM DECAY.

EMPLOY   PUT TO USE PRINCIPLES AND TECHNIQUES,
                      AS IN FOREMANSHIP.

EMPTY   REMOVE THE CONTENTS OF.

ENCODE (CODE)   CONVERT FROM ORDINARY LANGUAGE INTO CODE; E.G.
                      ENCODE A NAVAL OR INTERNATIONAL SIGNAL.

ENCOURAGE   INSPIRE WITH COURAGE AND SPIRIT; FOSTER ESPRIT
                      CORPS.

ENERGIZE   GIVE ENERGY TO, ACTIVATE; SWITCH ON; E.G.,
                      ENERGIZE A SUBMARINE FATHOMETER.

ENFORCE   COMPEL OBSERVATION OF OR COMPLIANCE WITH, SUCH
                      A REGULATION, RULE, POLICY, PROCEDURES; E.G.,
                      ENFORCE SAFETY REGULATIONS AND PROCEDURES.

ENGAGE   BRING TOGETHER OR INTERLOCK; INVOLVE ONESELF,
                      TAKE PART IN; E.G., ENGAGE IN STUDIES ON EFFE
                      OF LOW PRESSURE ON FLIGHT PERSONNEL.

ENGRAVE   CUT FIGURES, LETTERS, DEVICES IN A SURFACE FO
                      PRINTING; PRINT FROM AN ENGRAVED PLATE; IMPRE
                      AS WITH A GRAVER.

ENSURE   MAKE CERTAIN AND INEVITABLE; MAKE SURE OF; E.G
                      ENSURE MAXIMUM CARE OF PATIENTS.

ENTER   GO OR COME INTO A PLACE OR CONDITION; MAKE A
                      BEGINNING; BEGIN AS A PARTICIPANT; INSCRIBE,
                      ENROLL, RECORD; E.G., ENTER CHANGES IN
                      PUBLICATIONS.

EQUATE   TREAT, REGARD, OR EXPRESS AS EQUAL OR EQUIVALEN

EQUIP   FURNISH FOR SERVICE, FIT OUT, SUPPLY WITH WHAT IS
                               NECESSARY FOR EFFICIENT ACTION, PROVIDE WITH
                               ARMS, STORES, MUNITIONS, RIGGING, ETC.; E.G.,
                               EQUIP BOATS FOR ABANDONMENT OF SHIP.

ERECT   BUILD; SET UP; ESTABLISH.

ESTABLISH   INSTITUTE, MAKE FIRM, SET ON A FIRM BASIS, AS IN
                               ESTABLISHING SPECIFIC PROCEDURE TO BE FOLLOWED;
                               SET UP AN ORDER OF PRECEDENT.

ESTIMATE   FORM A JUDGMENT ABOUT, GAUGE, DETERMINE OR CAL-
                               CULATE APPROXIMATELY; E.G., ESTIMATE THE NEED
                               FOR SUPPLIES AND EQUIPMENT.

EVACUATE   EMPTY, VACATE, REMOVE SOMETHING FROM, ESPECIALLY
                               BY PUMPING; E.G., EVACUATE A REFRIGERANT.

EVALUATE   DETERMINE VALUE OR WORTH OF, APPRAISE; E.G.,
                               EVALUATE INSPECTION FORMS, WORK ORDERS, AND
                               DISCREPANCY REPORTS.

EXAMINE   INSPECT OR SCRUTINIZE CAREFULLY; TEST THE
                               KNOWLEDGE, REACTIONS, OR QUALIFICATIONS OF.

EXCHANGE   GIVE AND RECEIVE (EQUIVALENT OR SIMILAR THINGS)
                               IN RETURN; INTERCHANGE; E.G., EXCHANGE DAMAGED
                               ITEMS FOR A NEW OR REPAIRED ONE.

EXECUTE   FOLLOW OUT OR CARRY OUT; DO, PERFORM, FULFILL;
                               CREATE OR PRODUCE IN ACCORDANCE WITH AN IDEA,
                               PLAN, BLUEPRINTS, ETC.; E.G., EXECUTE CONTRACT
                               MODIFICATIONS.

EXERCISE   PUT INTO ACTION, USE, EMPLOY; PRACTICE, ACTIVATE
                               FOR THE PURPOSE OF TRAINING; EXERT CONTROL; E.G.
                               EXERCISE CONTROL OVER DEPARTMENTAL PUBLICATIONS.

EXHIBIT   PRESENT OR EXPOSE TO VIEW; SHOW, DISPLAY; GIVE
                               EVIDENCE OF, REVEAL.

EXPLAIN   MAKE SOMETHING CLEAR OR INTELLIGIBLE; INTERPRET
                               TO ASSURE UNDERSTANDING; E.G., EXPLAIN OPERATION
                               OF FLIGHT CONTROLS TO STUDENT PILOTS.

EXPLORE   INVESTIGATE SYSTEMATICALLY; STUDY; E.G., EXPLORE
                               SAILS.

EXPOSE   LAY OPEN TO, OR SET OUT FOR, INSPECTION OR EXAM-
                               INATION; REVEAL; SUBJECT A SENSITIVE PLATE OR
                               FILM TO RADIATION; E.G., EXPOSE PERIAPICAL,
                               OCCLUSAL AND BITEWING ROENTGENOGRAMS.

EXTERMINATE   GET RID OF COMPLETELY USUALLY BY KILLING OFF, AS

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VERMINS AND RATS.

EXTINGUISH   CAUSE TO CEASE BURNING.

EXTRACT.   DRAW OUT, PULL OUT, DEDUCE, DERIVE, MANAGE TO CB-
                      TAIN; COPY OUT, MAKE A SELECTION OR QUOTATION;
                      E.G., EXTRACT PORTIONS OF RADIO FREQUENCY PLANS.

FABRICATE   MAKE, BUILD, PUT TOGETHER, FRAME, MANUFACTURE, AS
                      BY ASSEMBLING PARTS (CONNOTES PROCESSING OVER A
                      PERIOD OF TIME RATHER THAN RELATIVELY INSTANTANE-
                      OUS CONSTRUCTION); E.G., FABRICATE RIGID TUBING
                      AND FLEXIBLE BASE ASSEMBLIES.

FAIL   FALL SHORT OF SUCCESS OR ACHIEVEMENT IN SOMETHING
                      EXPECTED, ATTEMPTED, DESIRED, OR APPROVED.
                      DEACTIVATE, DE-ENERGIZE OR OPEN; E.G., ISOLATE AN
                      ELECTRICAL CIRCUIT FOR TROUBLESHOOTING OR REPAIR
                      PURPOSES.

FAKE DOWN   COIL A ROPE OR HAWSER IN FAKES (COILS), ESPECI-
                      ALLY BY WINDING IN LAYERS USUALLY OF A ZIGZAG OR
                      FIGURE EIGHT FORM, TO PREVENT TWISTING OR FOULING
                      WHEN RUNNING OUT (NAUTICAL); E.G., FAKE DOWN
                      A LINE OR WIRE.

FASTEN   ATTACH FIRMLY OR SECURELY IN PLACE; FIX SECURE'
                      TO SOMETHING ELSE.

FEATHER   TURN THE BLADE OF ON OAR HORIZONTALLY AT THE
                      ISH OF A STROKE TO REDUCE RESISTANCE OF AIR O
                      WATER; CHANGE THE PITCH OF A VARIABLE PITCH P
                      PELLER ON AN AIRPLANE TO VARY AMOUNT OF BITE
                      THE AIR; BLEND EDGES TOGETHER BY FILING, SAND
                      ETC., ALSO TO SECURE AN ENGINE IN FLIGHT.

FEED   SUPPLY FOR USE OR CONSUMPTION; MOVE INTO A
                      MACHINE OR OPENING IN ORDER TO BE USED OR
                      PROCESSED; E.G., FEED FLATWORK INTO MANGLE.

FERRY   CARRY OR CONVEY OVER WATER IN A BOAT OR PLANE

FIELD-STRIP   TAKE APART, AS A HAND WEAPON, INSOFAR AS SUCH
                      DISASSEMBLY CAN BE ACCOMPLISHED PRACTICALLY
                      THE FIELD (NOT A COMPLETE STRIPPING OF THE WE
                      AS COULD BE MADE IN A REPAIR SHOP).

FILE   RUB SMOOTH OR CUT AWAY; ARRANGE IN ORDER
                      FOR REFERENCE; LAY AWAY DOCUMENTS, PAPERS, ETC.
                      IN A METHODICAL MANNER.

FILL   PUT INTO AS MUCH AS CAN BE HELD OR CONVENIENTLY
                      CONTAINED.

FILL OUT   MAKE COMPLETE BY INSERTING OR SUPPLYING INFORMA

TION.

FILTER   SEPARATE BY STRAINING.

FINISH   PROVIDE WITH A FINAL COAT OR SURFACE; E.G.,
                    FINISH A CONCRETE SURFACE.

FIRE   IGNITE OR DISCHARGE A FIREARM OR MILITARY WEAPCN.

FIRE FIGHT   FIGHT AND EXTINGUISH FIRES.

FIT   MAKE READY OR QUALIFIED; ADJUST TO REQUIRED FORM
                    AND SIZE, EFFECT CONFORMANCE TO; OUTFIT; E.G.,
                    FIT INTEGRATED TORSO HARNESS SUITS.

FIX   MAKE PERMANENT THE IMAGE ON A PHOTCGRAPHIC FILM
                    BY REMOVING UNUSED SALTS; REPAIR.

FLASK   ENCLOSE IN A FLASK, ESP., PLACE (A DENTURE) IN A
                    FLASK FOR PROCESSING.

FLEMISH DOWN   COIL A ROPE ON DECK IN A FLAT, CIRCULAR, CONCEN-
                    TRIC PATTERN (NOT ONE COIL ON TOP OF ANOTHER);
                    E.G., FLEMISH DOWN A LINE CR WIRE.

FLEX   BEND, PARTICULARLY TRACTABLE OR RESILIENT
                    MATERIAL.

FLUSH   POUR LIQUID OVER OR THROUGH; WASH OUT WITH A RU
                    OF LIQUID; OPEN.

FOLD   REDUCE THE LENGTH OR BULK OF BY FOLDING OVER;
                    ONE PART OVER ANOTHER PART.

FOLLOW UP   MAKE A RENEWED, REPEATED OR SUPPLEMENTARY ACTIO
                    BASED ON ACTION PREVIOUSLY INITIATED, TO PROMPT
                    A DESIRED RESPONSE.
                    CARRY TO COMPLETION; FOLLOW THROUGH.

FORECAST   PREDICT; INDICATE AS LIKELY TO OCCUR.

FORGE   FORM BY HEATING AND HAMMERING; HEAT INTO A SHA
                    E.G., FORGE METAL LINKS, PAD-EYES AND CHISELS.

FORM   CONSTRUCT; FRAME.

FORMAT   PRODUCE IN A SPECIFIED FORM OR STYLE.

FORMULATE   EXPRESS OR PUT IN SYSTEMATIZED STATEMENT; E.G.,
                    FORMULATE PLANS, POLICIES, PROCEDURES, ETC.

FORWARD   TRANSMIT; SEND ONWARD, AS A REPORT, THROUGH
                    CHANNELS.

FRAME   ENCLOSE IN A BORDER; E.G., FRAME A PICTURE.

FRAP
BIND TIGHTLY BY PASSING LINES AROUND; DRAW
TOGETHER THE PARTS OF TACKLE OR OTHER COMBINATION
OF ROPES TO INCREASE TENSION.

FUEL
PROVIDE WITH FUEL.

FUNCTION
SERVE; E.G., FUNCTION AS WATCH STANDER.

FURNISH
SUPPLY, PROVIDE, EQUIP; E.G., FURNISH SONAR
REPORTS TO SONAR STATIONS.

FUSE
REDUCE TO A LIQUID OR PLASTIC STATE BY HEAT;
BLEND BY MELTING TOGETHER.
ATTACH A FUZE TO; E.G., FUZE AIRCRAFT BOMBS AND
ROCKETS.

GAG
CHOKE OR STOP UP; E.G., GAG A SAFETY VALVE.

GAS
SUBJECT TO OR AFFECT WITH GAS; AS: STUPIFY OR
KILL WITH POISONOUS FUMES; FILL OR SUPPLY WITH
GAS.

GENERATE
START, BRING INTO EXISTENCE.

GIVE
PASS OVER, DELIVER, OR TRANSMIT IN ANY MANNER;
E.G., GIVE ARTIFICIAL RESPIRATION; GIVE MEANINGS
OF AIRCRAFT EMERGENCY SIGNALS.

GLAZE
FURNISH OR FILL WITH GLASS; E.G., GLAZE A WIN
COVER WITH A SMOOTH GLOSSY SURFACE OR COATING

GRADE
RATE, AS EFFICIENCY REPORTS, ON BASIS OF PER
MANCE; SLOPE OR INCLINE GRADUALLY; E.G. GRAD
ROAD SURFACES.

GRANT
GIVE (WHAT IS REQUESTED); ASSENT TO; E.G., G
SUBCONTRACT AND PURCHASE ORDER APPROVAL OR C
SENT.

GREASE
LUBRICATE, PARTICULARLY MOVING PARTS OF
MACHINERY.

GRIND
WEAR, SMOOTH, OR SHARPEN BY ABRASION OR FRIC

GRIND IN
LAP IN (AS A VALVE AND VALVE SEAT) SO THAT E
SURFACE SERVES AS A LAP FOR THE OTHER.

GRIPE
INFORM MAINTENANCE PERSONNEL OF A MALFUNCTION.
SECURE BOAT FOR SEA BY MEANS OF GRIPES.

GROUND
RUN ASHORE, STRIKE THE BOTTOM; REMOVE FROM FLIG
STATUS; CONNECT AN ELECTRICAL LEAD TO GROUND,
I.E. TO SHIP, CHASSIS, EARTH.

GUARD   WATCH OVER SO AS TO PREVENT ESCAPE, DISCLOSURE,
                                OR INDISCRETION.

GUIDE   REGULATE; MANAGE; DIRECT IN A CERTAIN WAY; ORDER;
                                INSTRUCT; SUPERINTEND TRAINING OF.

GUM   SMEAR, STIFFEN, OR CLOG WITH GUM OR A GUMMING
                                SUBSTANCE.

HAIL   ADDRESS A NEARBY BOAT OR SHIP.

HALF-MAST   LOWER TO A POSITION PART WAY (NOT NECESSARILY
                                HALF WAY) DOWN THE MAST OR FLAGSTAFF.

HANDLE   MANAGE, CONTROL, DIRECT, DEAL WITH, PERFORM A
                                FUNCTION WITH REGARD TO; TREAT, MANIPULATE;
                                TOUCH; E.G., HANDLE MANILA LINE OR WIRE ROPE OR
                                CARGO.

HANG   FASTEN TO AN ELEVATED POINT WITHOUT SUPPORT
                                FROM BELOW; FASTEN AS TO ALLOW FREE MOTION,
                                SUSPEND; FIX IN POSITION OR AT A PROPER ANGLE.

HARD-FACE   WELD A WEAR-RESISTANT METAL ONTO THE SURFACE OF
                                (A METAL PART).

HARDEN   MAKE HARD; E.G., HARDEN GRAVERS, SPRINGS, AND
                                SCREWDRIVER BITS.

HARMONIZE   BRING INTO ACCORD; E.G., HARMONIZE MELODIES IN
                                FOUR PARTS.

HEAVE   CAST, THROW; E.G., HEAVE A HEAVING LINE.

HOIST   LIFT OR RAISE, PARTICULARLY WITH THE AID OF
                                EQUIPMENT.

HOLD   HAVE OR KEEP IN POSITION; MAINTAIN GRASP; REMAI
                                FASTENED; STOP ACTION OF TEMPORARILY.

HONE   SHARPEN, GIVE AN EDGE TO, OR ENLARGE HOLES TO
                                PRECISE DIMENSIONS AND CONTROLLED FINISHES.

HOUSE   STOW OR SECURE IN A SAFE PLACE.

IDENTIFY   ESTABLISH THE IDENTITY OF; DISTINGUISH, DISCRIM
                                NATE; IN NAUTICAL PARLANCE, RECOGNIZE OR NAME;
                                E.G., IDENTIFY FLAGS AND ENSIGNS OF MAJOR
                                MARITIME POWERS.

ILLUSTRATE   MAKE CLEAR, EXPLAIN, DEMONSTRATE, AS BY FIGURES,
                                AND EXAMPLES; E.G., ILLUSTRATE CORRECT INSTRUMEN
                                FLIGHT TECHNIQUES; CREATE ILLUSTRATIONS.

IMMERSE   DIP OR PLUNGE INTO A FLUID.

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IMMOBILIZE   PREVENT FREEDOM OF MOVEMENT OR USE OF.

IMMUNIZE   MAKE IMMUNE.

IMPLEMENT   ACCOMPLISH, FULFILL, COMPLETE, CARRY OUT, PUT
                    INTO EFFECT; E.G., IMPLEMENT PLANS AND POLICIES.

IMPOSE   SUBJECT TO OR INFLICT, SUCH AS PUNISHMENT OR
                    PENALTY; E.G., IMPOSE ADMINISTRATIVE DISCIPLINARY
                    MEASURES.

IMPROVE   MAKE BETTER; E.G., IMPROVE COMMUNICATION CHANNELS
                    WITHIN THE CONFINEMENT FACILITIES.

IMPROVISE   INVENT OR MAKE SUBSTITUTION FOR IMMEDIATE EFFECT
                    OR RESULTS IN AN UNFORESEEN CIRCUMSTANCE OR
                    SITUATION.

INCORPORATE   UNITE WITH, OR INTRODUCE INTO, SOMETHING ALREADY
                    EXISTING; BLEND, ASSIMILATE; COMBINE INTO A
                    STRUCTURE OR ORGANIZATION; EMBODY, INCLUDE.

INDICATE   POINT OUT; SUGGEST; INTIMATE OR SHOW INDIRECTLY.

INDOCTRINATE   INSTRUCT IN RUDIMENTS OR PRINCIPLES OF.

INFORM   GIVE KNOWLEDGE TO; TELL; ACQUAINT WITH A FACT;
                    NOTIFY.

INITIATE   BRING INTO PRACTICE OR USE, INTRODUCE BY FIRST
                    DOING OR USING; E.G., INITIATE ROUTINE
                    CORRESPONDENCE.

INJECT   THROW, DRIVE OR FORCE INTO SOMETHING; E.G., F
                    INTO AN ENGINE; TO INTRODUCE AS AN ELEMENT OR
                    FACTOR IN OR INTO SOME SITUATION OR SUBJECT.

INNOCULATE   INTRODUCE MICROORGANISM INTO; INTRODUCE
                    IMMUNOLOGICALLY ACTIVE MATERIAL INTO, ESPECIA
                    TO TREAT OR PREVENT A DISEASE.

INSERT   PUT OR THRUST IN; INTRODUCE; E.G., INSERT A
                    BATHYTHERMOGRAPH CARD.

INSPECT   LOOK AT CAREFULLY, EXAMINE CRITICALLY; EXAMIN
                    REVIEW OFFICIALLY; E.G., INSPECT COMMUTATOR SE
                    MENTS AND BRUSHES FOR ALIGNMENT.

INSTALL   SET UP OR FIX FOR USE OR SERVICE; ESTABLISH IN A
                    PLACE; E.G., INSTALL A BOAT COMPASS.

INSTITUTE   START; SET UP; INTRODUCE; ESTABLISH; E.G.,
                    INSTITUTE MEASURE FOR PREVENTION AND CONTROL OF
                    DISEASE.

INSTRUCT   IMPART KNOWLEDGE SYSTEMATICALLY; INFORM; FURNISH
                      WITH DIRECTIONS; DIRECT OR COMMAND; TRAIN CR
                      INDOCTRINATE; E.G., INSTRUCT PERSONNEL IN
                      IDENTIFICATION OF SHIPS AND AIRCRAFT.

INTEGRATE   UNITE; COMBINE; UNIFY; CONSOLIDATE; ORGANIZE;
                      SYSTEMATIZE; PUT TOGETHER TO FORM A WHOLE; E.G.,
                      INTEGRATE WEAPONS PLANNING WITH GENERAL REPAIR
                      AND CONSTRUCTION SCHEDULING.

INTERACT   ACT UPON ONE ANOTHER; E.G., INTERACT WITH NUCCS.

INTERCHANGE   PROVIDE MUTUAL SUBSTITUTION IN ORDER TO ACHIEVE
                      SIMILAR RESULTS.

INTERPRET   EXPLAIN OR TELL THE MEANING OF; UNDERSTAND OR
                      APPRECIATE IN THE LIGHT OF INDIVIDUAL BELIEF,
                      JUDGMENT, OR INTEREST; CONSTRUE; E.G., INTERPRET
                      CONDITIONS FOR SONAR EFFECTIVE RANGE.

INTERROGATE   EXAMINE BY QUESTIONING; E.G., INTERROGATE PRISON-
                      ERS OF WAR.

INTERVIEW   MEET WITH PERSONALLY; SEE; CONSULT FORMALLY WITH;
                      USUALLY IMPLIES QUESTIONING OR OBTAINING INFORMA
                      TION; E.G., INTERVIEW OFFICER REPLACEMENTS TO
                      DETERMINE QUALIFICATIONS.

INVENTORY   MAKE AN ACCOUNT OF GOODS OR STOCK, USUALLY AT
                      REGULAR INTERVALS AND SOMETIMES INCLUDING THE
                      WORTH OF THE ITEMS LISTED; E.G., INVENTORY
                      ALLOWED MATERIALS.

INVEST   COVER WITH A REFRACTORY INVESTMENT MATERIAL;
                      E.G., INVEST METAL FRAMEWORKS.
                      ENDOW WITH QUALITY OR CHARACTERISTIC;
                      E.G., INVEST WAX PATTERNS.

INVESTIGATE   FOLLOW UP OR MAKE RESEARCH BY PATIENT EXAMINATII
                      OF FACTS, INQUIRY, AND OBSERVATION; E.G.,
                      INVESTIGATE ALL ROUTINE REPAIRS ABOARD SHIPS
                      ALONGSIDE.

IRON   SMOOTH WITH A HEATED IRON, E.G., IRON CLOTHES.

ISOLATE   SET APART FROM OTHERS, PLACES ALONE; E.G.,
                      ISOLATE DEFECTIVE COMPONENTS OF PRESSURIZATION
                      SYSTEMS.

ISSUE   GIVE OUT OFFICIALLY, AS ORDERS AND DIRECTIVES,
                      SUPPLIES, AND EQUIPMENT.

JACK   MOVE OR LIFT, INCREASE; E.G., HOIST OR RAISE WITH
                      A JACK.

JACK OVER   TURN A MAIN ENGINE OR TURBINE BY MEANS OF AN
                   AUXILIARY (JACKING) ENGINE.

JETTISON   DISCARD; CAST OFF AS AN ENCUMBRANCE.

JOIN   CONNECT; LINK TOGETHER.

JUMP   BYPASS; CLOSE A BREAK-IN OR CUT-OUT PART OF A
                  CIRCUIT.

KEEP   MAINTAIN; E.G., KEEP RECORDS.

KEYPUNCH   PUNCH HOLES OR NOTCHES IN CARDS. IN CERTAIN PAT-
                  TERNS, A MEANS OF PREPARING DATA FOR ENTERING IT
                  INTO A COMPUTER.

KNOW   DEMONSTRATE KNOWLEDGE; E.G., KNOW THE LAWS OF
                  DIVING.

LABEL   IDENTIFY BY DESCRIBING OR AFFIXING WRITTEN
                  MATERIAL ON SPECIFIC OBJECTS; DESCRIBE OR
                  DES.GNATE; DISTINGUISH, IDENTIFY.

LACE   SECURE TOGETHER A GROUP OR BUNDLE OF ELECTRICAL
                  LEADS/WIRES BY MEANS OF A CONTINUOUS PIECE OF
                  CORD FORMING HITCHES AT REGULAR INTERVALS AROUND
                  THE GROUP OR BUNDLE; DRAW OR PASS THROUGH
                  EYELETS OR GROMMETS.

LAP   WORK TWO SURFACES TOGETHER WITH OR WITHOUT ABRA-
                  SIVES UNTIL A VERY CLOSE FIT IS PRODUCED.

LASH DOWN   TIE DOWN AND FASTEN WITH ROPE, CABLE, CHAIN,
                  ETC.; E.G., LASH DOWN AND SECURE AIRCRAFT.

LATCH   MAKE FAST WITH OR AS WITH A LATCH.

LAUNCH   CAUSE TO SLIDE FROM LAND INTO WATER, SET AFLOAT
                  SEND OFF, GIVE A START TO, PUT IN OPERATION;
                  E.G., LAUNCH PONTOON BARGES; CAUSE TO BECOME
                  AIRBORNE; E.G., LAUNCH AIRCRAFT.

LAUNDER   WASH CLOTHING, BEDDING, ETC.

LAY   SET IN ORDER OR POSITION (AS BRICKS).

LAY OUT   PREPARE MATERIAL FOR A SUBSEQUENT WORK OPERATION
                  E.G., LAY OUT ELEMENTARY DESIGNS OR METAL STRUC-
                  TURES.

LEAD   DIRECT IN ACTION OR OPINION; GUIDE OR CONDUCT;
                  PRECEDE AND DIRECT IN MOVEMENTS, AS LEAD MEN.

LETTER   PRINT; INSCRIBE.

LEVEL

BRING TO A COMMON LEVEL OR PLANE; AIM A GUN OR OTHER WEAPON HORIZONTALLY; FIND HEIGHTS OR POINTS OF LAND.

LIGHT-OFF

LIGHT UP; SET A FIRE GOING, ESPECIALLY IN A BOILER OR A CORE OVEN, OR IN OIL-FIRED, INDIRECT ARC, OR RESISTOR FURNACES.

LIST

SET DOWN IN A LIST; CAUSE (A VESSEL) TO LEAN TO ONE SIDE.

LIVE

SURVIVE; E.G., LIVE AT DEPTHS IN A SATURATED CONDITION.

LOAD

LAY A LOAD OR BURDEN ON OR IN; PLACE A LOAD OR CHARGE IN (A FIREARM, ROCKET LAUNCHER;ETC.); E.G., LOAD GUNS.

LOCALIZE

LIMIT OR CONFINE TO A PLACE, AREA, OR LOCALITY; DETERMINE THE ORIGIN OR PLACE OF, AS AN ORGANIC OR MECHANICAL MALFUNCTION, ETC.; E.G., LOCALIZE A MALFUNCTION IN EQUIPMENT SUBASSEMBLIES.

LOCATE

DESIGNATE THE SITE OR PLACE OF, DEFINE THE LIMITS OF; STATION SOMEONE IN PLACE; SEARCH FOR AND DISCOVER THE POSITION OF; E.G., LOCATE AN ENEMY SUBMARINE; LOCATE DAMAGE CONTROL FITTINGS; LOCATE IN DARKNESS, NAVIGATION RUNNING LIGHT SWITCHES; LOCATE A MALFUNCTION.

LOCK

MAKE SECURE OR INACCESIBLE BY MEANS OF LOCKS.

LOG

ENTER INTO A NAVAL RECORD; AS A SHIP'S LOG OR CORRESPONDENCE LOG; E.G., LOG ROUTINE CORRESPONDENCE.

LOOSEN

FREE FROM RESTRAINT; UNTIE, DETACH, SLACKEN.

LOWER

LET DESCEND; REDUCE THE HEIGHT OF; BRING DOWN.

LUBRICATE

APPLY A LUBRICANT (OIL, GREASE, GRAPHITE, ETC.); MAKE SLIPPERY.

MACHINE

PLANE, SHAPE, TURN, MILL, ETC. BY MACHINE; E.G., MACHINE A CONCAVE OR CONVEX SURFACE.

MAINTAIN

HOLD OR KEEP IN A STATE OR CONDITION, ESPECIALLY IN A STATE OF EFFICIENCY, NEWNESS, VALIDITY, OR CLEANLINESS; E.G., MAINTAIN A SURFACE PLOT; KEEP PROPERTY (REAL ESTATE, MACHINERY, EQUIPMENT) IN SUCH FASHION AS NOT TO LET FAIL OR DECLINE; SUPPORT, SUSTAIN, UPHOLD, DEFEND.

MAKE

BRING INTO BEING BY FORMING OR SHAPING; PUT

TOGETHER BY COMPONENTS; PRODUCE AS A RESULT OF
ACTION, EFFORT, OR BEHAVIOR.

MAKE OUT   DRAW UP OR PREPARE IN WRITING; E.G., MAKE OUT RE-
                           PORTS.

MAN   FURNISH WITH MEN FOR WORK OR DEFENSE; TAKE AS-
                           SIGNED PLACES FOR WORK OR DEFENSE; STRENGTHEN,
                           BRACE OR FORTIFY; E.G., MAN A SOUND-POWERED PHONE
                           HEADSET.

MANAGE   CONTROL, GUIDE, DIRECT, OR ADMINISTER, AS A
                           FACILITY, PROGRAM, PROJECT, OR AN OFFICE.

MANEUVER   CAUSE TO EXECUTE TACTICAL MOVEMENTS; MANAGE OR
                           BRING ABOUT WITH SKILL; MANIPULATE; E.G.,
                           MANEUVER BOAT ALONGSIDE.

MANGLE   PRESS OR SMOOTH AS LINEN.

MANIPULATE   OPERATE WITH HANDS OR MECHANICAL MEANS;
                           E.G., MANIPULATE LEVERS.

MANUFACTURE   MAKE BY HAND, MACHINERY, OR OTHER AGENCY; WORK
                           INTO SUITABLE FORMS FOR USE; FABRICATE; E.G.,
                           MANUFACTURE REINFORCED CONCRETE BLOCK.

MARK   PUT A MARK ON, I.E., FIX OR TRACE OUT THE BOUND
                           OR LIMITS OF; E.G., MARK SURVEY STAKES.

MARRY   MATCH COMPONENTS FOR COMPATIBLE OPERATION;
                           SYNCHRONIZE; MATCH UP, BRING TOGETHER.

MASK OUT   COVER OR CONCEAL, AS BY SURFACING OVER WITH TA
                           E.G., MASK OUT NONPRINTING AREAS.

MATCH   CAUSE TO CORRESPOND.

MATE   JOIN TOGETHER.

MEASURE   ASCERTAIN THE EXTENT, DEGREE, QUANTITY,
                           DIMENSIONS OR CAPACITY OF, BY A STANDARD; HENG
                           ESTIMATE; E.G., MEASURE RADAR RINGTIME.

MEET   BECOME ACQUAINTED WITH; CONFORM TO; E.G., MEET
                           DEADLINES.

MELT   REDUCE FROM A SOLID TO A LIQUID STATE, USUALLY BY
                           HEATING; E.G., MELT FERROUS AND NONFERROUS
                           ALLOYS.

MEND   MAKE (SOMETHING BROKEN, WORN, TORN, OR OTHERWISE
                           DAMAGED) WHOLE, SOUND, OR USABLE BY REPAIRING.

MILL   SHAPE OR DRESS BY MEANS OF A ROTARY CUTTER.

MIX   COMBINE OR BLEND INTO ONE MASS.

MODIFY   MAKE CHANGES IN OR ALTERATIONS TO.

MONITOR   OBSERVE, LISTEN TO, CHECK ON (AS EQUIPMENT,
                       PERSON, OR FUNCTION) FOR COMPLIANCE WITH
                       INSTRUCTIONS, REGULATIONS, OR EFFECTIVENESS;
                       E.G., MONITOR COMMUNICATIONS TRANSMISSIONS.

MOUNT   ATTACH TO A SUPPORT; ARRANGE OR ASSEMBLE FOR USE
                       OR DISPLAY; FRAME.

MOVE   PASS FROM ONE PLACE OR POSITION TO ANOTHER.

NAME   GIVE A NAME TO IDENTIFY, SPECIFY, OR MENTION BY
                       NAME; DESIGNATE.

NAVIGATE   DETERMINE POSITION OF SHIP, PLANE, OR BOAT;
                       STEER, DIRECT, OR PLOT THE COURSE FOR A SHIP OR
                       AIRCRAFT.

NEGOTIATE   CONFER, BARGAIN, OR DISCUSS WITH A VIEW TOWARD
                       REACHING AN AGREEMENT; E.G., NEGOTIATE CONTRACT
                       MODIFICATIONS.

NEUTRALIZE   COUNTERACT THE ACTIVITY OR EFFECT OF; MAKE
                       INEFFECTIVE.

NOMINATE   DESIGNATE OR NAME; PROPOSE FOR SOME HONOR.

NOTATE   MUSIC FIELD: REPRESENT SOUND BY WRITTEN OR PRINT-
                       ED CHARACTERS.

NOTIFY   INFORM; MAKE KNOWN, GIVE NOTICE OF.

OBSERVE   ADHERE TO, FOLLOW, KEEP OR ABIDE BY (LAW, DUTY,
                       RULE, CUSTOM); CELEBRATE; NOTICE OR PERCEIVE, PA
                       SPECIAL ATTENTION; EXAMINE SCIENTIFICALLY; E.G.,
                       OBSERVE THE SAFETY PRECAUTIONS APPROPRIATE TO
                       ELECTRONIC EQUIPMENT.

OBTAIN   PROCURE, GET POSSESSION OF; E.G., OBTAIN DATA FO
                       INCLUSION IN A ROUGH DECK LOG.

OFFICIATE   ACT IN AN OFFICIAL CAPACITY; SERVE AS A LEADER O
                       CELEBRANT OF A CEREMONY, AS A RELIGIOUS SERVICE.

OIL   PROVIDE WITH LUBRICANT.

OPAQUE   MAKE SO AS NOT TO ADMIT LIGHT; PAINT OVER IN
                       ORDER TO BLOT OUT PORTIONS (AS OF A NEGATIVE);
                       E.G., OPAQUE DEFECTS.

OPEN   ENTER UPON; BEGIN; TO MAKE AVAILABLE FOR ENTRY OF

PASSAGE BY BURNING BACK OR CLEARING A WAY.

OPERATE
PUT INTO OR CONTINUE IN OPERATION OR ACTIVITY;
MANAGE, CONDUCT, CARRY OUT OR THROUGH; DRIVE, AS
TO OPERATE A VEHICLE; MANIPULATE CONTROLS TO PRO-
DUCE AN EFFECT OR FUNCTION; E.G., OPERATE A VOICE
RADIO OR SHUTTER SEARCHLIGHT.

ORDER
COMMAND; GIVE AN ORDER TO; PLACE ON ORDER; E.G.,
ORDER FIREROOM SUPPLIES.

ORGANIZE
ARRANGE; SYSTEMATIZE PERSONS OR THINGS INTO PROP-
ER PLACES, ESPECIALLY IN RELATION TO EACH OTHER;
GIVE STRUCTURE TO; PUT IN PROPER ORDER.

ORIENT
PUT (PARTICULARLY ONESELF) INTO CORRECT POSITION
OR RELATION, ACQUAINT (ONESELF) WITH AN ENVIRON-
MENT, CONDITION, OR SITUATION; SET OR ARRANGE IN
POSITION; FIX DIRECTION; E.G., ORIENT STUDENT ON
COURSE REQUIREMENTS.

ORIGINATE
BEGIN, PRODUCE AS NEW, SUCH AS PROCEDURES, PLANS,
TECHNIQUES, ETC.

OUTFIT
FIT OUT OR EQUIP WITH FOR ANY PURPOSE, AS FOR A
JOURNEY.

OUTLINE
SUMMARIZE MOST SIGNIFICANT FEATURES OF, OR GIVE
PRELIMINARY OR GENERAL SKETCH OF, AS BATTLE
PLANS, SYSTEMS, REGULATIONS, ETC.

OVERHAUL
EXAMINE THOROUGHLY AND CHECK FOR NEEDED REPAIRS
MAKE REPAIRS AND ADJUSTMENTS NEEDED TO RESTORE
WORKING ORDER; E.G., OVERHAUL GENERATING AND
CONTROL EQUIPMENT.

PACK
PREPARE GOODS, BOOKS, EQUIPMENT, MATERIALS, ETC
FOR SHIPMENT; FILL COMPLETELY; E.G., PACK A
WHEEL BEARING.

PACKAGE
WRAP OR BOX AS FOR SELLING, CARRYING, DISPOSIN
OR STORAGE; E.G., PACKAGE ITEMS FOR SHIPPING.

PAINT
APPLY OR TREAT WITH A COATING BY BRUSHING, SWA
BING, OR SPRAYING; ELECTRONICALLY DISPLAY TARGE
ON CATHODE RAY TUBE.

PARALLEL
COMPARE OR INDICATE ANALOGY OF; SHOW SOMETHING
EQUAL OR CORRESPONDENT TO; PLACE SO AS TO BE
CORRESPONDENT IN DIRECTION OR OUTPUT; E.G.,
PARALLEL GENERATORS.

PARTICIPATE
TAKE A PART OR SHARE WITH OTHERS IN SOME
ACTIVITY, ENTERPRISE, ETC.; E.G., PARTICIPATE AS
A LEADER IN RECREATIONAL AFFAIRS.

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PASS   TRANSFER FROM ONE TO ANOTHER.

PATCH   MEND, REPAIR, STRENGTHEN, ETC., WITH A PATCH OR
                        OVERLAY; E.G., PATCH LACERATIONS, ABRASIONS AND
                        PUNCTURES OF LIFE RAFTS; CONNECT CIRCUITS.

PATROL   CONDUCT ROUTINE SECURITY ROUNDS; PATROL PROPERTY

PAY   FILL THE SEAMS OF A WOODEN VESSEL WITH PITCH OR
                        OTHER SUBSTANCE; LET OUT (A ROPE) BY SLACKENING;
                        GIVE IN RETURN FOR GOODS OR SERVICES.

PEEN   HAMMER, BEND, ETC., WITH A PEEN (THE HEMISPHERI-
                        CAL OR WEDGE-SHAPED END OF A HAMMER); E.G., PEEN
                        COLD RIVETS.

PERFORM   CARRY OUT OR EXECUTE SOME ACTION.

PHOTOGRAPH   TAKE A PICTURE OF.

PILOT   CONTROL THE FLIGHT OF AN AIRCRAFT; STEER A SHIP
                        INTO OR OUT OF . HARBOR OR PORT, OR THROUGH
                        DIFFICULT WATERS.

PIN   FASTEN OR SECURE WITH A PIN.

PIPE   CALL OR DIRECT BY THE BOATSWAIN'S PIPE; E.G.,
                        PIPE ALL SHIPBOARD CALLS.

PLACE   SET OR ARRANGE TO ESTABLISH IN A CERTAIN
                        POSITION, AS RANK, ORDER, CONDITION, ETC.;
                        DISPOSE OF IN A DESIRED OR SELECTED WAY; E.G.,
                        PLACE SURVEY STAKES.

PLAN   REPRESENT AS BY A DIAGRAM; DEVISE OR PROJECT AS A
                        METHOD OR COURSE OF ACTION; PREARRANGE THE DETAIL
                        OF, AS TO PLAN A CAMPAIGN; INTEND, PROPOSE TO C°
                        E.G., PLAN A DAILY WORK ASSIGNMENT.

PLOT   MAKE A PLAN OR MAP OF SOMETHING; MARK THE POSI-
                        TION OF SOMETHING ON A MAP OR PLAN; DELINEATE,
                        DRAW, OUTLINE AN ACTION IN ADVANCE, LAY OUT, DE
                        VISE; E.G., PLOT BEARINGS, RANGES, AND FIXES ON
                        NAUTICAL CHARTS.

PLUG   STOP, MAKE TIGHT, OR SECURE BY INSERTING A PLUG.

POISE   MAKE BALANCE, EQUALIZE, KEEP STEADY, AS IN THE
                        PHRASE "POISE A CLOCK BALANCE WHEEL."

POLISH   BRING TO A HIGHLY DEVELOPED, FINISHED, OR REFINED
                        STATE; MAKE SMOOTH AND GLOSSY, USUALLY BY FRIC-
                        TION; BURNISH.

POSITION   PUT IN PROPER PLACE, OR ARRANGE PROPERLY.

POSSESS   OWN; E.G., POSSESS KNOWLEDGE OF ROAD RULES.

POST   TRANSFER OR CARRY FROM A BOOK OF ORIGINAL ENTRY
TO A LEDGER; MAKE TRANSFER ENTRIES IN; PUBLISH;
ANNOUNCE, OR ADVERTISE BY OR AS IF BY USE OF A
PLACARD; PUT NOTICES ON A BULLETIN BOARD OR OTHE
CONSPICUOUS PLACE; E.G., POST WEATHER FORECASTS;
POSITION, AS POST A WATCH.

POT   SEAL ELECTRICAL CONNECTORS AND CIRCUITS;
USE POTTING COMPOUND.

POUR   CAUSE TO FLOW OR TO PASS AS IF FLOWING INTO A
MOLD.

PREDICT   DECLARE IN ADVANCE; FORETELL ON THE BASIS OF OB-
SERVATION, EXPERIENCE, OR SCIENTIFIC REASON OR
DATA; E.G., PREDICT RADAR RETURNS; PREDICT TIDES

PREPARE   ADAPT OR QUALIFY BEFOREHAND FOR A PURPOSE, END C
CONDITION; MAKE READY, PUT INTO A STATE FOR USE
OR APPLICATION; E.G., PREPARE A REQUEST FOR
SURVEY.

PRESCRIBE   LAY DOWN OR SET AS A GUIDE, DIRECTION OR RULE
ACTION (PROCEDURES, REGULATIONS, ETC.); E.G.,
PRESCRIBE METHODS FOR ESTIMATING BUDGETS.

PRESENT   GIVE OR BESTOW FORMALLY; MAKE KNOWN; GIVE IN
MATION OR EXPLANATION; OFFER FOR CONSIDERATI
VIEW; E.G., PRESENT FINDINGS OF AN INVESTIGA
PRESENT PROJECT OR PROGRAM PROPOSALS TO HIGH
AUTHORITY.

PRESERVE   KEEP FROM HARM, DAMAGE, DANGER, ETC.; PROTEC
KEEP FROM SPOILING OR ROTTING; MAINTAIN; E.G
PRESERVE AIRCRAFT ENGINES.

PRESIDE   ASSUME POSITION OF AUTHORITY AT A MEETING OR
HEARING; ACT AS CHAIRMAN; E.G., PRESIDE AT
MEETING.

PRESS   SQUEEZE WITH APPARATUS OR INSTRUMENTS TO A
DESIRED DENSITY, SMOOTHNESS, OR SHAPE; SMOOT
CLOTHING WITH A HEATED FLATIRON; PRESS BEARING
ON A SHAFT.

PRESSURIZE   APPLY PRESSURE TO; MAINTAIN NORMAL AIR PRESSURE
IN AN AIRCRAFT OR SUBMARINE; E.G., PRESSURIZE
CONTAINERS WITH LOW PRESSURE AIR AND NITROGEN.

PRIME   PUT INTO WORKING ORDER BY FILLING OR CHARGING
WITH SOMETHING; LAY THE FIRST COATING OR

PREPARATION ON IN PAINTING; FILL OR LOAD.

PRINT
LETTER; PRODUCE DOCUMENTS, PRESS RELEASES, SHIP'S NEWSPAPER.

PROCESS
CARRY OUT SPECIFIED STEPS OR OPERATIONS; E.G., PROCESS MESSAGES, PROCESS NEWLY ASSIGNED PERSONNEL; SUBJECT TO A SPECIAL TREATMENT; E.G., PROCESS PHOTOGRAPHIC FILM.

PROCURE
OBTAIN, SECURE, GET PURCHASE THROUGH APPROPRIATE CHANNELS; E.G., PROCURE DENTAL SUPPLIES AND EQUIPMENT.

PRODUCE
CAUSE TO OCCUR OR EXIST; CREATE BY MENTAL OR PHYSICAL EFFORT.

PROGRAM
ARRANGE OR FURNISH A PROGRAM OF OR FOR; WORK OUT A SEQUENCE OF OPERATIONS TO BE PERFORMED, SUCH AS BY A COMPUTER.

PROMULGATE
MAKE KNOWN; SPREAD KNOWLEDGE OF AND INFORMATION ON THROUGH ESTABLISHED CHANNELS.

PROOF-LOAD
TEST FOR STRENGTH BY EXERTING EXTRA PULL, E.G., PROOF-LOAD WIRE ROPE SOCKET.

PROOFREAD
READ AND MARK CORRECTIONS ON, SUCH AS A DOCUMENT.

PROTECT
COVER OR SHIELD FROM INJURY OR DESTRUCTION.

PROVIDE
SUPPLY FOR USE, FURNISH; EQUIP IN PREPARATION; E.G., PROVIDE SPEED AND LATITUDE DATA TO GYRO ELECTRICIAN FOR GYROCOMPASS CORRECTION.

PUBLICIZE
GIVE PUBLICITY TO.

PUBLISH
MAKE GENERALLY KNOWN, MAKE PUBLIC ANNOUNCEMENT, PRINT, RELEASE FOR PUBLICATION.

PULL
EXERT FORCE UPON SO AS TO CAUSE OR TEND TO CAUSE MOTION TOWARD THE FORCE; DRAW OUT FROM; USE FORCE IN DRAWING, DRAGGING, OR TOWING.

PUMP
DELIVER OR DRAW WITH A PUMP.

PURCHASE
PROCURE EQUIPMENT, SUPPLIES, OR SERVICES AT A MONETARY COST.

PURGE
CLEANSE OR RID OF IMPURITIES, FOREIGN MATTER, OR UNDESIRABLE ELEMENTS; CLEAR AWAY, OFF OR OUT; DRAIN OFF WATER OR AIR (NAUTICAL); E.G., PURGE AIR FROM AIR CONDITIONING SYSTEMS.

PUSH
PRESS AGAINST WITH FORCE IN ORDER TO DRIVE OR IM

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                            PEL; ENDEAVOR TO MOVE AWAY OR AHEAD BY STEADY
                            PRESSURE WITHOUT STRIKING; PRESS FORWARD
                            AGAINST OPPOSITION OR WITH ENERGY.

QUALIFY   DETERMINE AN INDIVIDUAL'S CAPABILITY OF PERFORM-
                            ING A SPECIFIC FUNCTION IN ACCORDANCE WITH ESTAB-
                            LISHED STANDARDS; EXHIBIT A REQUIRED DEGREE OF
                            PROFICIENCY IN AN OCCUPATICNAL AREA; E.G.,
                            QUALIFY LANDING SIGNAL OFFICERS; QUALIFY AS A
                            STEERSMAN.

RAISE   SET UPRIGHT BY LIFTING OR BUILDING; ELEVATE;
                            INCREASE THE STRENGTH, INTENSITY, OR PITCH OF;
                            INCREASE THE DEGREE OF.

RAKE   LOOSEN OR SMOOTH AS WITH A RAKE.

REACTIVATE   MAKE ACTIVE AGAIN.

READ   INTERPRET THE MEANING OF.

READY   MAKE READY, PUT IN A STATE OF ORDER OR PREPARA-
                            TION; E.G., READY MINES FOR SHIPMENT..

REAM   WIDEN THE OPENING OF; ENLARGE OR DRESS OUT
                            (A HOLE) WITH A REAMER; PRESS OUT WITH A REAMER.

REASSEMBLE   REFIT TOGETHER THE PARTS OF.

REBABBITT   REAPPLY BABBITT METAL; REAPPLY ANY ANTI-FRICTION
                            ALLOY; E.G., REBABBITT A BEARING SURFACE.

REBUILD   RECONSTRUCT, REMODEL.

RECEIVE   ACCEPT DELIVERY OF SOMETHING; ACQUIRE INSTRUCTI
                            OR INFORMATION; E.G., RECEIVE SURPLUS MATERIAL
                            FOR DISPOSAL.

RECHECK   CHECK AGAIN; E.G., RECHECK EQUIPMENT.

RECLAIM   GET BACK, PURIFY FOR REUSE; E.G., RECLAIM USED
                            MERCURY.

RECOGNIZE   KNOW BY SOME DETAIL, AS OF APPEARANCE; IDENTIFY
                            E.G., RECOGNIZE FRIENDLY AND ENEMY SHIPS AND
                            PLANES.

RECOMMEND   ADVISE; COUNSEL; OFFER OR SUGGEST COURSE OF
                            ACTION; E.G., RECOMMEND A SURVEY OF GENERAL AND
                            TECHNICAL STORES ITEMS.

RECONCILE   MAKE CONSISTENT; BRING INTO HARMONY; E.G., RECON-
                            CILE PHYSICAL INVENTORY WITH STOCK RECORDS.

RECONDITION   RESTORE TO GOOD CONDITION; E.G.,

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RECONDITION HYDRAULIC VALVES AND CYLINDERS.

RECORD   WRITE, ENTER, REGISTER FOR PURPOSE OF EVIDENCE OR
                        REPRODUCTION; E.G., RECORD DATA IN A CHRONOMETER
                        RECORD BOOK; TRANSFORM SOUND BY ELECTRICAL OR
                        MECHANICAL MEANS, AND REGISTER IT IN SOME
                        PERMANENT FORM.

RECOVER   REGAIN; RECLAIM; SAVE FROM LOSS AND RESTORE TO
                        USEFULNESS; HAUL BACK ABOARD GEAR PREVIOUSLY
                        PASSED OR STREAMED, AS TRANSFER RIG OR MINESWEEP-
                        ING GEAR.

RECRUIT   ENGAGE FOR MILITARY SERVICE; E.G. RECRUIT
                        INDIVIDUALS INTO THE U.S. NAVY.

REDUCE   DIMINISH (ESPECIALLY IN BULK, AMOUNT, OR EXTENT);
                        BRING INTO A CERTAIN ORDER, ARRANGEMENT OR CLAS-
                        SIFICATION; BRING FROM ONE FORM TO ANOTHER; E.G.,
                        REDUCE FIELD SURVEY NOTES.

REEVE   PASS, AS THE END OF A ROPE, THROUGH ANY HOLE OR
                        OPENING IN A BLOCK, RINGBOLT, ETC.; FASTEN BY
                        PASSING THROUGH A HOLE AND/OR AROUND SOMETHING;
                        E.G., REEVE A SINGLE WHIP, RUNNER, LUFF TACKLE CR
                        TWOFOLD PURCHASE.

REFACE   RENEW A FACED SURFACE WITH A DIFFERENT MATERIAL,
                        OR (AS ON THE END OF A CYLINDRICAL PIECE) BY RE-
                        CUTTING OR REGRINDING.

REFER   SEND OR DIRECT TO SOME PERSON, PLACE OR THING,
                        AS FOR TREATMENT; E.G., REFER TO LOGIC OR
                        SCHEMATIC SYMBOLS.

REFURBISH   MAKE CLEAN, BRIGHT, OR FRESH AGAIN; RENOVATE.

REGISTER   ENTER IN A RECORD OR LIST, ENROLL, RECORD OFFI-
                        CIALLY; INDICATE ON A SCALE; SAFEGUARD BY HAVING
                        A RECORD MADE, AS REGISTERED MAIL; E.G., REGISTER
                        PAY ALLOTMENTS.

REGULATE   CONTROL OR GOVERN ACCORDING TO A RULE, PRINCIPLE,
                        OR SYSTEM; ADJUST FOR ACCURATE OPERATION, AS
                        GAUGES OR SCALES; E.G., REGULATE WATER LEVEL IN A
                        STEAMING BOILER.

REHEARSE   TRAIN OR MAKE PROFICIENT BY PRACTICE PRIOR TO A
                        PUBLIC PERFORMANCE.

REINFORCE   STRENGTHEN BY ADDITIONAL ASSISTANCE, MATERIAL,
                        OR SUPPORT.

REINSTALL   REPLACE WITH ORIGINAL; E.G., REINSTALL SYSTEMS.

RELAY   PASS ON, AS MESSAGES, THROUGH COMMUNICATION SYS-
                       TEMS.

RELEASE   SET FREE, UNFASTEN AND LET GO (AS SOMETHING
                       SNAGGED); PERMIT TO BE SHOWN, ISSUED, PUBLISHED;
                       E.G., RELEASE DATA ON CASUALTIES.

REMOVE   CHANGE THE LOCATION OF BY TAKING OFF, OUT OF, CR
                       AWAY FROM, LIFTING, PUSHING ASIDE; E.G., REMOVE A
                       BATHYTHERMOGRAPH CARD.

REMOVE/REPLACE   TAKE AN ITEM FROM (OFF) AND REINSTALL THE SAME
                       ITEM, A REPLACEMENT ITEM, OR A NEW ITEM.

RENDER   CAUSE TO BE OR TO BECOME, AS RENDER A FORTRESS
                       SECURE; REPRESENT OR DEPICT; FURNISH, AS AN
                       ACCOUNT OF MONEY OR ACTIONS; GIVE, DELIVER, OR
                       TRANSMIT, AS TO RENDER A MESSAGE, CR PASSING
                       HONORS TO NAVAL SHIPS, GIGS, AND BARGES; DR
                       RENDER ARTIFICIAL RESPIRATION.

RENEW   MAKE NEW AGAIN; E.G., RENEW BEARINGS.

REPACK   PACK AGAIN; E.G., REPACK STUFFING BOXES ON
                       CENTRIFUGAL PUMPS.

REPAIR   RESTORE TO WORKING CONDITION, AS EQUIPMENT, AT
                       FIELD OR HIGHER ECHELON MAINTENANCE; E.G., REPA
                       RADIO HEADSETS AND MICROPHONES.

REPIVOT   PROVIDE WITH OR MOUNTS ON A PIVOT, AS OF WRIST
                       WATCH PINIONS.

REPLACE   RESTORE TO A FORMER PLACE OR POSISTION; TAKE T
                       PLACE OF; SUPPLY AN EQUIVALENT FOR; E.G., REPLA
                       HYDROPHONES AND TRANSDUCERS.

REPLENISH   FILL UP AGAIN; REPLACE.

REPORT   RELATE; TELL; REPEAT; PREPARE AN ACCOUNT OF,
                       ORALLY OR IN WRITING; PRESENT CONCLUSIONS
                       REACHED; MAKE, ISSUE OR SUBMIT FORMAL REPORT;
                       PRESENT ONESELF, AS REPORT FOR DUTY.

REPRESENT   SERVE AS THE OFFICIAL AND AUTHORIZED DELEGATE O
                       AGENT FOR; ACT AS THE SPOKESMAN FOR.

REPRODUCE   PRODUCE AGAIN; PRODUCE A COPY OF.

REQUISITION   MAKE A FORMAL REQUEST, APPLICATION OF WRITTEN
                       ORDER, AS FOR EQUIPMENT, TOOLS, PAPER, FOOD, SUP-
                       PLIES, ETC.; E.G., REQUISITION MATERIALS OR
                       REPAIR PARTS.

RESCUE   FREE FROM ANY CONFINEMENT, VIOLENCE, OR DANGER;

E.G., RESCUE SOMEONE IN CONTACT WITH AN ENERGIZED
CIRCUIT.

RESEARCH   MAKE AN EXTENSIVE INVESTIGATION INTO; SCRUTINIZE,
                      STUDY.

RESEAT   SEAT OR SEAT AGAIN; E.G., RESEAT INTAKE AND EX-
                      HAUST VALVES.

RESOLVE   ANALYZE, DETERMINE, DECIDE, SETTLE, SOLVE, EX-
                      PLAIN, CONVINCE, ASSURE; IMPLIES POSITION AND
                      AUTHORITY FOR MAKING A DECISION.

RESTORE   PUT BACK IN A FORMER OR ORIGINAL STATE.

RESUME   BEGIN AGAIN AFTER INTERRUPTION.

RESUSCITATE   REVIVE, BRING BACK TO LIFE OR CONSCIOUSNESS;
                      E.G., RESUSCITATE A VICTIM OF ELECTRICAL SHOCK.

RETRIEVE   RECOVER, REGAIN, BRING BACK, RESTORE TO THE PLACE
                      OF ORIGIN; E.G., RETRIEVE A BATHYTHERMOGRAPH.

RETURN   BRING OR SEND BACK; GO BACK.

REVIEW   EXAMINE CRITICALLY OR DELIBERATELY; E.G., REVIEW
                      TRANSACTIONS INVOLVING EXPENDITURE OF FUNDS;
                      REVIEW PRODUCTION SCHEDULE.

REVISE   LOOK AT OR OVER AGAIN AND CORRECT OR IMPROVE AS
                      ESTIMATES, PLANS; MAKE NEW, IMPROVED, UP-TO-DATE
                      VERSION OF, AS PROCEDURES.

REWIND   WIND AGAIN, ESPECIALLY TO REVERSE THE WINDING O●
                      (AS FILMS); E.G., REWIND AN ELECTRICAL MOTOR.

REWRITE   PUT INTO FORM FOR PUBLICATION.

RIG   FURNISH WITH APPARATUS OR GEAR; EQUIP; PUT IN
                      ORDER FOR USE; FIT SHROUDS, STAYS, ETC., TO MAS●
                      SPAR, ETC.; E.G., RIG EJECTION SEAT AND CANOPY
                      COMPONENTS.

RIP   SAW OR SPLIT WOOD WITH THE GRAIN; TEAR OR SPLIT
                      APART OR OPEN.

RIVET   FASTEN WITH OR AS IF WITH RIVETS.

ROLL ON   PRESS, SPREAD, OR LEVEL WITH A ROLLER; APPLY
                      PAINT, ETC., WITH A ROLLER.

ROTATE   CHANGE THE POSITION OF; TURN ABOUT A CENTER.

ROUTE   SEND, FORWARD, OR TRANSPORT IN AN ESTABLISHED
                      MANNER; ARRANGE THE COURSE OF; FIX THE ORDER OF

PROCEDURE IN A SERIES OF OPERATIONS; E.G., ROUTE
CLASSIFIED MATTER.

SAFEGUARD   PROTECT, DEFEND; TAKE PRECAUTIONARY MEASURES.

SALVAGE   SAVE ANY PROPERTY FROM DESTRUCTION.

SAMPLE   TAKE A SAMPLE OF; TEST.

SANITIZE   MAKE SANITARY (AS BY CLEANING OR STERILIZING).

SAW   CUT WITH A SAW.

SCALE   ARRANGE IN A GRADUATED SERIES. SCALE A TEST; MAKE
OR PATTERN IN REGULARLY GRADED PROPORTIONS;
REGULATE.

SCAN   LOOK AT CLOSELY, SCRUTINIZE; IN ELECTRONICS
(TELEVISION AND RADAR), TRAVERSE (A SURFACE) WITH
A BEAM OF LIGHT OR ELECTRONS; E.G., SCAN AREAS
WITH RADAR TO LOCATE TARGETS.

SCHEDULE   DESIGNATE FIXED TIMES FOR ACCOMPLISHMENT OF, AS
TRAINING PROGRAMS, MAIL DELIVERIES, COURIER
SERVICE, ETC.

SCORE   DETERMINE THE MERIT OF; GRADE; MAKE SCRATCHES
METAL, ETC., BEFORE BENDING OR CUTTING.

SCRAPE   REMOVE FROM A SURFACE USUALLY BY REPEATED STRO
OF AN EDGED INSTRUMENT; MAKE SMOOTH OR CLEAN
WITH STROKES OF AN EDGED INSTRUMENT OR ABRASIV

SCREEN   EXAMINE, USUALLY METHODICALLY, IN ORDER TO SEP
RATE INTO DIFFERENT GROUPS; SELECT OR ELIMINAT
BY A SCREENING PROCESS; E.G., SCREEN CANDICATE
FOR PROMOTION; SCREEN DEFECTIVE COMPONENTS FOR
FEASIBILITY OF REPAIR.

SCRUB   CLEAN A SURFACE WITH HARD RUBBING; SCOUR.

SEAL   MAKE GAS TIGHT BY PROCESS OF SEALING TO PREVE
LEAKAGE; E.G., SEAL OPTICAL ASSEMBLIES.

SEARCH   LOOK FOR, HUNT THROUGH, EXAMINE, GO OVER,
EXPLORE, INQUIRE, SCRUTINIZE.

SEASON   TREAT SO AS TO PREPARE FOR USE; E.G., SEASON A
MAGNETRON.

SECURE   MAKE SAFE; MAKE FIRM, FAST, OR TIGHT.

SEGREGATE   SET APART FROM THE MAIN MASS OR GROUP; E.G.,
SEGREGATE USABLE MATERIAL (FROM SCRAP).

SEIZE   TAKE HOLD OF SUDDENLY OR FORCIBLY; BIND TOGETHER.
                          MARRY TWO LINES OR WIRE ROPE. TAKE POSSESSION OF
                          BY LEGAL PURPOSES; E.G., SEIZE EVIDENCE.

SELECT .. .   TAKE BY PREFERENCE FROM AMONG OTHERS; E.G.,
                          SELECT PORTABLE POWER TOOLS FOR MAINTENANCE.

SELL   GIVE UP SOMETHING FOR MONEY OR OTHER VALUABLE
                          CONSIDERATION.

SEND   DISPATCH BY SOME MEANS OF COMMUNICATION.

SEPARATE   SET OR KEEP APART, DISPERSE IN SPACE OR TIME;
                          ISOLATE FROM A MIXTURE.

SEQUENCE   ARRANGE IN A CONTINUOUS OR CONNECTED SERIES.

SERVE   GIVE SERVICE TO; ASSIST; PERFORM THE DUTIES OF A
                          SPECIFIC ASSIGNMENT; PREPARE AND/OR DISTRIBUTE
                          FOOD; E.G., SERVE AS A TECHNICAL CONSULTANT TO A
                          BOARD OF OFFICERS; SERVE AS CREW MEMBER; SERVE
                          MEALS IN THE ENLISTED MEN'S MESS.

SERVICE   PERFORM MAINTENANCE, REPAIR, INSTALL, SUPPLY,
                          DISTRIBUTE, ETC., FOR OR UPON; E.G., SERVICE A
                          MESSAGE, I.E., CONVERT VISUAL OR RADIO HEADINGS
                          INTO PLAIN ENGLISH ACCORDING TO ADDRESSES, PRE-
                          CEDENCE, ROUTING AND SPECIAL INSTRUCTIONS; SUPPL
                          AIRCRAFT OR MOTOR VEHICLES WITH FUEL/OIL.

SET   PLACE IN A DESIRED POSITION, ADJUSTMENT, OR CON-
                          DITION (AS A THERMOSTAT); ADJUST IN CONFORMITY
                          WITH.

SET UP   BRING INTO ACTIVE OPERATION OR USE; INSTITUTE;
                          ESTABLISH, ARRANGE; PUT TOGETHER OR ERECT.

SEW   UNITE OR FASTEN BY STITCHES MADE WITH A FLEXIBL
                          THREAD OR FILAMENT.

SHARPEN   MAKE SHARP.

SHAVE   SEVER THE HAIR FROM CLOSE TO THE SKIN WITH A
                          RAZOR.

SHELLAC   COAT WITH OR OTHERWISE TREAT WITH SHELLAC CR A
                          SHELLAC VARNISH.

SHIFT   CHANGE THE PLACE, POSITION OR DIRECTION OF, MOVE
                          AS FROM ONE PLACE OR PERSON TO ANOTHER; TRANSFER;
                          E.G., SHIFT TO EMERGENCY STEERING CONTROLS.

SHIM   FILL OUT OR LEVEL UP BY USING A SHIM (THIN, OFTEN
                          TAPERED PIECE OF MATERIAL--METAL, WOOD, STONE).

SHIP   CAUSE TO BE TRANSPORTED; TAKE INTO A SHIP OR
                        BOAT.

SHORE   .   PROP; BRACE.

SHORT CIRCUIT   BYPASS; CONNECT SOMETHING OF LOW RESISTANCE
                        BETWEEN POINTS ON A CIRCUIT BETWEEN WHICH THE
                        RESISTANCE IS NORMALLY MUCH GREATER.

SHOW   EXPLAIN; TEACH; INSTRUCT; DEMONSTRATE.

SHRED   CUT OR TEAR INTO SHREDS; E.G., SHRED CLASSIFIED
                        MATERIAL.

SIGN   AFFIX ONE'S SIGNATURE TO.

SIGNAL   COMMUNICATE BY FLAGS, SEMAPHORE. LIGHT, ETC.;
                        MAKE SOUNDS OR GESTURES TO GIVE WARNING OR
                        COMMAND; ELECTRICALLY TRANSMIT MESSAGES OR
                        INFORMATION.

SING   PRODUCE MUSICAL TONES BY MEANS OF THE VOICE.

SKETCH   MAKE A ROUGH DRAWING, DRAFT, OR OUTLINE.

SLICE   CUT WITH OR AS WITH A KNIFE; E.G., SLICE MEAT.

SOLDER   BRING INTO OR RESTORE TO FIRM UNION (BY SOLDER
                        JOIN WITH SOLDER; E.G., SOLDER PIPE FITTINGS.

SOLICIT   ASK OR SEEK EARNESTLY; REQUEST A SUBMISSION OF
                        E.G., SOLICIT BIDS TO CONTRACT FOR PRODUCTION
                        EQUIPMENT.

SOLVE   DETERMINE ANSWERS TO PROBLEMS; E.G., SOLVE MAT
                        EMATICAL PROBLEMS.

SORT   ARRANGE ACCORDING TO CHARACTERISTICS.

SOUND   MEASURE THE DEPTH OF.

SPEAK   ARTICULATE SOUNDS WITH THE ORDINARY VOICE; TA
                        ENUNCIATE.

SPECIALIZE   TRAIN IN A SPECIAL FIELD OR STUDY.

SPELL   NAME, WRITE, OR PRINT THE LETTERS OF, IN ORDER

SPIN   GYRATE; REVOLVE RAPIDLY; CAUSE TO WHIRL.

SPLICE   JOIN OR UNITE (ROPES AND WIRES) BY WEAVING
                        TOGETHER THE END STRANDS; E.G., SPLICE HALYARDS.

SPLIT   DIVIDE INTO PARTS OR PORTIONS.

SPOT   MARK OR SOIL WITH SPOTS; PLACE ON A DESIGNATED
                     SPOT; LOCATE.

SPOT TIE   SECURE WIRE BUNDLES AT DISCRETE POINTS.

SPOT-IN   MAKE A MARK ON A SURFACE AS A LOCATOR FOR LAYING
                     OUT OR OTHER OPERATIONS; E.G., SPOT-IN
                     CENTRIFUGAL PUMP BEARINGS.

SPRAY   DISPERSE OR APPLY A JET OF VAPOR OF FINELY
                     DIVIDED LIQUID.

SPRUE   CONSTRUCT AND ATTACH AN OPENING THROUGH WHICH
                     MOLTEN METAL FLOWS INTO A MOLD TO SNAKE A
                     CASTING; E.G., SPRUE METAL FRAMEWORKS (FOR A
                     DENTURE).

STABILIZE   MAKE FIRM OR STABLE; KEEP FROM CHANGING OR
                     FLUCTUATING; E.G., STABILIZE PRICES.

STACK   PILE UP; ARRANGE IN A PILE WHOSE SIDES ARE RELA-
                     TIVELY UNIFORM, SO AS TO PREVENT COLLAPSE OF THE
                     STRUCTURE; E.G., STACK CARGO, USING HANDTRUCKS,
                     FORKLIFTS, ETC.

STAMP   CUT OUT, BEND, OR FORM WITH A STAMP OR DIE;
                     IMPRESS, IMPRINT, ATTACH A STAMP TO.

STAND   PERFORM THE DUTY OF; E.G., STAND THE FIRE WATCH

STAND BY   WAIT; BE AVAILABLE (USUALLY FOR DAMAGE CONTROL)
                     E.G., STAND BY AIRCRAFT WITH FIRE BOTTLE OR
                     EMERGENCY EQUIPMENT DURING FUELING, STARTING,
                     BRAKES, HOT REFUELING, ETC.

START   BEGIN; CAUSE TO MOVE OR OPERATE; E.G., START EC
                     EQUIPMENT.

STEER   SET AND HOLD A COURSE; GUIDE BY MECHANICAL MEAN
                     E.G., STEER SHIP IN RESTRICTED WATERS.

STERILIZE   FREE FROM LIVING GERMS; E.G., STERILIZE DENTAL
                     INSTRUMENTS.

STITCH   WORK UPON, JOIN, MEND, OR FASTEN WITH STITCHES
                     SEW.

STOCK   LAY UP IN STORE, AS FOR FUTURE USE.

STOP   CAUSE TO CEASE; ARREST THE PROGRESS OR MOTION OF;
                     E.G., STOP IFF EQUIPMENT.

STORE   DEPOSIT IN A PLACE (AS A WAREHOUSE) FOR PRESERVA-
                     TION AND/OR SECURITY.
                     PUT ASIDE OR ACCUMULATE FOR USE WHEN NEEDED.

STOW
PLACE OR ARRANGE IN A COMPACT MASS; PUT IN ITS PROPER, OR IN A SUITABLE AND/OR CONVENIENT PLACE; FILL BY PACKING CLOSELY; E.G., STOW CHARTS AND OTHER NAVIGATIONAL AIDS, STOW PATTERNS.

STRAIGHTEN
MAKE STRAIGHT; PUT IN ORDER; E.G., STRAIGHTEN STRUCTURAL SHAPES.

STRAP
SECURE WITH OR ATTACH BY MEANS OF A BAND, PLATE, LOOP OF METAL OR OTHER MATERIAL FOR BINDING OR CLAMPING OBJECTS TOGETHER OR IN POSITION.

STREAM
CAUSE TO FLOW; PAY OUT, AS IN AIR OR WATER; E.G., STREAM A BATHYTHERMOGRAPH.

STRESS-RELIEVE
REMOVE FORCE WHICH TENDS TO PRESS, PULL, PUSH, OR TWIST; E.G., STRESS-RELIEVE METALS.

STRIKE
COME INTO FORCIBLE CONTACT OR COLLISION WITH; HIT INTO OR AGAINST; STOW BELOW; DELETE FROM; CANCEL.

STRING
STRETCH LIKE A STRING; E.G., STRING TELEPHONE LINES.

STRIP
SEPARATE COMPONENTS FROM A MIXTURE OR SOLUTION; REMOVE EXTRANEOUS OR SUPERFICIAL MATTER FROM; E.G., STRIP NEGATIVES FOR SINGLE COLOR WORK; MOUNT A PHOTOGRAPHIC NEGATIVE OR POSITIVE IN POSITION ON COPY TO BE USED FOR MAKING A PRINT PLATE.
DIVEST OF HONORS, PRIVILEGES OR FUNCTIONS.

SUBDIVIDE
DIVIDE THE PARTS OF INTO MORE PARTS; E.G., SUBDIVIDE GIVEN PROBLEMS.

SUBMIT
PRESENT OR REFER TO OTHERS FOR DECISION OR CONSIDERATION; E.G., SUBMIT REPORTS, PROPOSAL ESTIMATES, ETC.

SUBSTITUTE
PUT IN THE PLACE OF ANOTHER; EXCHANGE, REPLACE WITH A SIMILAR ITEM.

SUMMARIZE
MAKE A SUMMARY OF; STATE OR EXPRESS IN A CONC FORM.

SUPERVISE
GIVE DIRECT ORDERS AND INSTRUCTIONS FOLLOWED UP BY PERSONAL OBSERVATION OF ACTIVITIES OF SUBORDINATES.

SUPPORT
AID THE CAUSE OF; E.G., SUPPORTS DEEP DIVE SYSTEMS.

SURVEY
EXAMINE WITH REFERENCE TO CONDITION, SITUATION,

	VALUE, ETC., WITH THE INTENT OF DISPOSING CF; INSPECT; ALSO, TECHNICALLY, DETERMINE AND DELINEATE THE FORM, EXTENT, POSITION, ETC., OF A TRACT OF LAND.
SUTURE	JOIN TOGETHER WITH (GUT, THREAD, WIRE, ETC.), FOR THE PURPOSE OF STITCHING UP A WOUND OR INCISION; E.G., SUTURE MINOR WOUNDS.
SWAB	CLEAN WITH A SWAB; APPLY MEDICATION WITH A SWAB.
SWEAT	CAUSE TO PERSPIRE, AS BY DRUGS, EXERCISE, HEAT; CAUSE TO GIVE FORTH MOISTURE (AS PIPES); HEAT A METAL IN ORDER TO EXTRACT AN EASILY FUSIBLE CONSTITUENT; HEAT SOLDER UNTIL IT MELTS; UNITE METAL PARTS BY HEATING AT THE POINT CF CONTACT; E.G., SWEAT A WATERTIGHT OR AIRTIGHT FLANGE, JOINT, STUD, OR LEAD.
SWEEP	REMOVE FROM A SURFACE WITH A BROOM OR BRUSH.
SWIM	PROPEL ONESELF THROUGH OR UNDER WATER.
SWING	SUSPEND SO AS TO PERMIT SWAYING OR TURNING; SHIFT OR FLUCTUATE FROM ONE CONDITION, FORM, POSITION OR OBJECT OF ATTENTION OR FAVOR TO ANOTHER; TURN A HINGE OR PIVOT.
SYNCHRONIZE	CAUSE TO BE OR APPEAR SYNCHRONOUS; ARRANGE OR TABULATE SO AS TO INDICATE COINCIDENCE OR COEXISTENCE; RENDER SYNCHRONOUS IN OPERATION; E.G., SYNCHRONIZE ALTERNATORS.
SYNTHESIZE	FORM (A MATERIAL OR ABSTRACT ENTITY) BY COMBINING PARTS OR ELEMENTS.
TACK	SECURE BY SOME SLIGHT OR TEMPORARY FASTENING.
TAG	PROVIDE WITH OR AS IF WITH A TAG; SUPPLY WITH IDENTIFYING MARKER; E.G., TAG CIRCUIT BREAKERS, SUPPLY BINS, VALVES, ETC.
TAKE	RECORD; E.G. TAKE WINDING DATA.
TAP	CUT THREADS ON INTERNAL SURFACES.
TAPE	FASTEN, TIE, BIND, COVER, OR SUPPORT WITH TAPE; E.G., TAPE GYPSUM WALLBOARD.
TEMPER	BRING (STEEL, GLASS, OR THE LIKE) TO A DEGREE OF HARDNESS AND TOUGHNESS; E.G., TEMPER GRAVERS AND SPRINGS.
TEND	MINISTER TO THE NEEDS OF; E.G., TEND A DIVER.

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TEST
EXAMINE CRITICALLY OR TRY OUT MATERIAL; MEASURE
PERFORMANCE, TOLERANCES, ETC., OF MACHINERY,
EQUIPMENT, ETC., WITH SPECIAL TOOLS OR EQUIPMENT

TESTIFY
MAKE A SOLEMN DECLARATION UNDER OATH FOR PURPOSE
OF ESTABLISHING A FACT.

THREAD
FORM A SCREW THREAD ON; PASS INTO OR THROUGH
SOMETHING AS FILM INTO A PROJECTOR.

TIE
ATTACH, MAKE A BOND OR CONNECTION; FASTEN.

TIGHTEN
CLOSELY CONSTRICT IN ORDER TO EFFECT IMMOBILITY
OR IMPENETRABILITY; DRAW OR STRETCH; FIX
VERY FIRMLY IN PLACE.

TIME
FIX THE INTERVAL BETWEEN (ACTIONS, EVENTS, ETC.)

TORQUE
TIGHTEN TO A SPECIFIED VALUE USUALLY MEASURED I
INCH POUNDS OR FOOT POUNDS.

TOW
DRAG OR PULL ALONG, HAUL; DRAW OR PULL AFTER BY
ROPE OR CHAIN, ESPECIALLY THROUGH WATER; E.G.,
TOW A BOAT.

TRACE
FOLLOW THE PATH, DEVELOPMENT, PROCESS OR HIS
OF, ESPECIALLY BY PROCEEDING FROM THE LATEST
THE EARLIEST EVIDENCE; FIND OR DETERMINE BY
PROCEDURE; DRAW WITH LINES, DELINEATE; MAKE
DIAGRAM; NOTE AND MARK A COURSE ON A MAP; E.
TRACE CIRCUITS THROUGH FIRE CONTROL TRANSMIS
EQUIPMENT.

TRACK
FOLLOW THE COURSE OF, TRACE BY MEANS OF SUCH
DENCE AS RADAR BLIPS AND SONAR ECHOES.

TRAIN
FORM OR IMPART PROFICIENCY BY TEACHING, DRIL
INSTRUCTING, DISCIPLINE, ETC.; MOVE GUN OR S
LAR WEAPON HORIZONTALLY.

TRANSCRIBE
TRANSLATE DATA OR INFORMATION FROM ONE RECOR
FORM TO ANOTHER; PARAPHRASE IN WRITING; E.G.
TRANSCRIBE OFFICER MESSAGE ORDERS.

TRANSFER
CONVEY FROM ONE PLACE, PERSON, OR THING TO A
ER; TRANSPORT, REMOVE, OR CAUSE TO PASS TO AN
ER; PRINT OR OTHERWISE COPY FROM ONE SURFACE
ANOTHER; MAKE OVER THE POSSESSION OR CONTROL OF
CONVEY; DIRECT REASSIGNMENT OF PERSONNEL; E.G.,
TRANSFER FUEL, SUPPLIES.

TRANSLATE
CHANGE A TEXT FROM ONE LANGUAGE INTO ANOTHER;
CHANGE INTO ANOTHER MEDIUM OR FORM; E.G.,
TRANSLATE ORDERS INTO PLANS OF ACTIONS.

TRANSMIT   SEND, FORWARD, TRANSFER FROM ONE PLACE TO
                            ANOTHER; IMPLIES PASSING ON TO OTHERS THROUGH
                            ESTABLISHED CHANNELS.

TRANSPORT   CARRY FROM ONE PLACE TO ANOTHER, ESPECIALLY OVER
                            RELATIVELY LONG DISTANCES; E.G., TRANSPORT AN
                            INJURED PERSON BY FIREMAN'S LIFT.

TRANSPOSE   CHANGE THE USUAL, NORMAL, OR RELATIVE POSITION
                            OF; WRITE OR PLAY A MUSICAL COMPOSITION IN A
                            DIFFERENT KEY; E.G., TRANSPOSE INSTRUMENTAL MUSIC
                            BY WHOLE TONES.

TREAT   SUBJECT TO SOME ACTION OR PROCESS TO IMPROVE
                            APPEARANCE, TASTE, USEFULNESS, ETC.; PROCESS,
                            BRING OR PUT A PERSON OR THING INTO A SPECIFIED
                            OR IMPLIED CONDITION BY TREATING; E.G., TREAT
                            CHEMICALLY A CLOSED COOLING SYSTEM OF AN INTERNAL
                            COMBUSTION ENGINE.

TRIM   MAKE TRIM AND NEAT, ESPECIALLY BY TRIMMING AND
                            CLIPPING; ARRANGE THE WEIGHTS (FUEL, WATER) IN A
                            SHIP TO OBTAIN THE DESIRED IMMERSION FORWARD OR
                            AFT; ADJUST CONTROL SURFACES TO OBTAIN THE
                            DESIRED ATTITUDE OF A PLANE OR SUBMARINE.

TROUBLESHOOT   EVALUATE A SYSTEM OR EQUIPMENT TO DETERMINE AND
                            ISOLATE THE CAUSE OF A MALFUNCTION; E.G.,
                            TROUBLESHOOT ELECTRICAL AND MECHANICAL CONTROL
                            SYSTEMS.

TRUE   MAKE TRUE; ESPECIALLY FIT, PLACE, MAKE, SHAPE,
                            ADJUST ACCURATELY; E.G., TRUE PRESSURE GAGE
                            HAIRSPRINGS.

TUNE   ADJUST OR ADAPT TO A CONDITION, STATE, ETC.;
                            BRING INTO HARMONY OR AGREEMENT; E.G., TUNE AN
                            ELECTRONIC MECHANISM SUCH AS SURVEILLANCE RADAR.

TURN   CAUSE TO MOVE AROUND AN AXIS OR CENTER; ROTATE;
                            TWIST; TURN ON A LATHE.

TURN IN   DELIVER UP OR HAND OVER, AS TURN IN A REPAIRABLE
                            ITEM.

TURN-UP   START AN AIRCRAFT.

TYPE   PRODUCE WRITTEN INFORMATION BY MEANS OF A TYPE-
                            WRITER; CLASSIFY, AS IN BLOODTYPES.

UNCRATE   REMOVE FROM CRATE.

UNDERCUT   CUT AWAY MATERIAL FROM THE UNDER SIDE OF; E.G.,
                            UNDERCUT ARMATURE COMMUTATORS.

UNDERPIN   FORM PART OF, STRENGTHEN, OR REPLACE THE FOUNDA-
                TION OF.

UNDERSTAND   PERCEIVE AND COMPREHEND THE NATURE AND
                SIGNIFICANCE OF; KNOW.

UNFASTEN   LOOSEN, UNPIN, UNBUCKLE, UNDO, DETACH.

UNLOAD   TAKE OFF, DELIVER, DISCHARGE FROM, DRAW CHARGE
                FROM, AS UNLOAD A GUN.

UNLOCK   OPEN OR RELEASE BY, OR AS BY, UNDOING A LOCK OR
                LOCKING DEVICE.

UNMATE   SEPARATE; UNMATCH; E.G., UNMATE MISSILES.

UNPACK   REMOVE COVERING FROM.

UNPLUG   UNCLOG, CLEAR AN OBSTRUCTION.

UNSCRAMBLE   SEPARATE INTO ORIGINAL COMPONENTS; RESTORE
                (SCRAMBLED COMMUNICATIONS) TO INTELLIGIBLE FORM.

UPDATE   BRING UP TO DATE; REVISE; MAKE CURRENT; E.G., UP-
                DATE AIR CONTROLMAN DATA CARDS.

UPGRADE   RAISE OR IMPROVE THE GRADE OF; RAISE THE
                CLASSIFICATION OF.

UPHOLSTER   FURNISH WITH (USUALLY, SOFT) COVERING.

UPSET   SHORTEN AND THICKEN (A RED-HOT IRON) BY BEATING
                ON THE END; E.G., UPSET A RIVET.

USE   EMPLOY; CARRY OUT PURPOSE OR ACTION BY MEANS OF;
                EXPEND OR CONSUME BY PUTTING TO USE; E.G., USE
                ELECTRICAL AND ELECTRONIC SCHEMATICS.

UTILIZE   PUT TO USE FOR A SPECIFIC PURPOSE; E.G., UTILIZE
                DATA.

VACUUM   OPERATE A VACUUM DEVICE TO CLEAN.

VALIDATE   VERIFY; SUBSTANTIATE; E.G., VALIDATE PROGRAMMED
                INSTRUCTION MATERIAL.

VARNISH   COVER WITH VARNISH.

VEER   LET ANCHOR CABLE, LINE, OR CHAIN RUN OUT BY ITS
                OWN WEIGHTS.

VENT   PROVIDE WITH AN OPENING FOR THE ESCAPE OF A GAS
                OR LIQUID OR FOR THE RELIEF OF PRESSURE.

VENTILATE   VENT; CAUSE AIR TO CIRCULATE; E.G., VENTILATE AND

CLEAN TANKS.

VERIFY   PROVE, CONFIRM; SUBSTANTIATE; AUTHENTICATE; CHECK OR TEST THE ACCURACY OR EXACTNESS OF.

WALK DOWN   WALK DOWN OR ALONG A RUNWAY, TAXIWAY, OR PARKING AREA TO PICK FOREIGN OBJECTS THAT MIGHT BE INGESTED INTO JET ENGINES; E.G., FOD WALKDOWN.

WARM   MAKE READY FOR OPERATION OR PERFORMANCE BY PRELIMINARY OPERATION; E.G., WARM UP MAIN STEAM LINES.

WARN   GIVE NOTICE TO BEFOREHAND, ESPECIALLY OF DANGER; URGE OR ADVISE TO BE CAREFUL.

WASH   CLEANSE BY OR AS IF BY THE ACTION OF LIQUID, ESPECIALLY WATER; PASS THROUGH A BATH TO CARRY OFF IMPURITIES OR SOLUABLE COMPONENTS; E.G., WASH LINE AND HALF-TONE NEGATIVES.

WAX   APPLY PROTECTIVE WAX COATING; SHAPE A WAX PATTERN OF THE BASE OF A DENTURE AROUND COMPLETED TOOTH ARRANGEMENT TO FORM A TRIAL DENTURE.

WEIGH   LIFT THE ANCHOR OFF THE BOTTOM; MEASURE THE WEIGHT OF.

WELD   UNITE OR CONSOLIDATE METALLIC PARTS BY HEATING OR HAMMERING.

WHIP   BIND THE ENDS OF LINE TO PREVENT FRAYING.

WIND   TIGHTEN THE SPRING OF; E.G., WIND CHRONOMETERS; TURN A SHIP AT A PIER.

WIPE   RUB WITH SOMETHING SOFT FOR CLEANING; E.G., WIPE DOWN AN AIRCRAFT.

WIRE   USE WIRE ON; E.G., WIRE SHUT A VALVE; INSTALL ELECTRIC WIRES IN OR ON.

WRAP   COVER, ESPECIALLY BY WINDING OR FOLDING; ENCLOSE WITH PROTECTIVE COVERING.

WRITE   PRODUCE A COMPOSITION; COMPOSE; DRAW UP OR COMPOSE IN LEGAL FORM; E.G., WRITE CAPTIONS FOR PICTURES.

ZERO   DETERMINE OR ADJUST THE ZERO OF; E.G., ZERO SYNCHROS.

HANDBOOK FOR CONSTRUCTION OF TASK INVENTORIES

FOR NAVY ENLISTED RATINGS

APPENDIX D

HOW TO WRITE TASK STATEMENTS
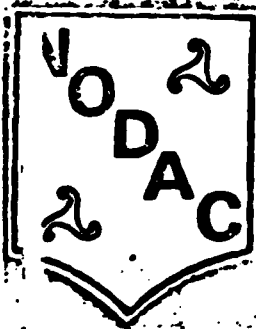
HOW TO WRITE TASK STATEMENTS

This appendix was prepared to help first-time task statement writers develop the skills and experience needed for writing acceptable task statements to cover the work of a Navy enlisted rating. A comprehensive list of tasks should include ALL tasks that are now performed in the rating and NO tasks that are irrelevant to the work of the rating. This will ensure that later analyses and decisions related to the occupational classification structure of the Navy, the design of training curriculums, enlisted advancement requirements, manning determinations, and future manpower/hardware interface requirements will neither neglect important aspects of the work performed, nor waste time on irrelevant aspects. Individuals who have had some experience in task statement writing will also find this appendix helpful for review and for learning more about the rules to follow in writing acceptable task statements.

Practice exercises are spaced throughout this appendix to help you apply what you are learning. If you are a new task statement writer, you will want to have your own copy of this appendix so you can work the practice exercises. Most of the exercises have feedback following them, so you can work through them by yourself. For others, you will need the help of a co-worker or your supervisor. Time spent learning the material in this appendix will help you avoid the pitfalls in task statement writing and increase your ability to produce good task statements easily.

Definition of a Task

A task is a unit of work that occupies a significant portion of work time spent in the performance of a duty. It is the most specific level of behavior in a job and describes the performance of a meaningful job function in terms of a specific action applied to a particular object. The behavior must be observable, have a definite beginning and end, and result in a completed work action or a measurable work product (either the performance can be observed or the results of the performance can be seen and measured).

A task is a unit of physical or mental activity and represents a composite of methods, procedures, and techniques which commonly serve to accomplish one meaningful unit of work. Tasks involve worker interactions with such objects and concepts as equipment, material, other people, information, ideas, data, and events. In most instances, the performance of a task by a worker has a reasonably definite beginning and end, the whole activity requiring a mixture of decisions, perceptions, procedures, and/or physical actions serving a useful job purpose or a particular work assignment.

Supervisory and managerial tasks often are more mental than physical in nature reflecting an emphasis on information processing and communication functions. These functions are common features of many jobs dealing with the supervision or management of personnel. Supervisory and managerial tasks

need not be limited to observable work performance, but often may identify
job activities not readily discernible by a person other than the worker.
Although these activities are not readily observable, there should always be
an observable outcome, end product, or service.

EXAMPLES OF TASKS

Task	Outcome
Rotate tires	Properly placed tires
Sort mail	Mail sorted to correct address
Adjust carburetor	Properly adjusted carburetor (good mix of air and fuel)
Package classified materials for shipment	Classified materials properly packaged
Prepare keypunch work sheets	Work sheets prepared
Align collimators	Collimators aligned
Flush transmissions or torque converters	Transmission or torque converter flushed
Adjust float control valves on refueling equipment	Float control valves adjusted
Adjust propeller controls	Propeller controls adjusted
Counsel recruits on pay and allowances	Recruits knowledgeable about pay and allowances
Forecast future budget requirements	Future budget requirements forecast (estimated)

Below are listed some things that are NOT tasks.

- Worker qualifications (such as intelligence, aptitude, knowledge,
  education, skill, training, and experience) are not tasks and are
  not included in the task section of an inventory. However, in-
  formation regarding certain qualifications, such as training,
  education, and work experience may be obtained by including
  appropriate items in the background information section of the
  inventory.

- Receiving of instruction is not a task unless actual useful work
  is performed during the training. Thus, classroom instruction,
  self-instruction, laboratory or shop instruction, and the coaching
  a person receives are not tasks. On-the-job training, however,
  may include the performance of work tasks under a supervisor.
  The giving of instruction, when it is a part of a job assignment,

is considered to be a task activity. Similarly, continuation training that is a routine part of the job to maintain a particular skill (such as practice in the use of emergency equipment), is considered to be a task of the job.

- Job responsibilities, position assignments, and work goals are not tasks. Although a part of a total description of the work, they serve here as useful sources and justifications for tasks, but are not themselves stated as tasks.

- Responsibilities and functions of an agency, shop, work center, team, or office are not tasks. Tasks are activities of people, not of organizations.

PRACTICE EXERCISE

Indicate which of the following items are tasks that are observable and measurable.

   ✓   1. Manufacture dummy wooden torpedoes.

   ✓ 2. Calculate firing data for the MK-16 torpedo.

   ✓   3. Troubleshoot suspension system.

   ✓   4. Apply first aid measures to a chemical casualty.

       5. Understand battle tactics.

   ✓   6. Perform inventory control duties.

   ~   7. Process special request/authorization (NAVPERS 1336/6).

Check your responses with the feedback on the next page.

FEEDBACK

__TASK__ 1. Manufacture dummy wooden torpedoes. This activity is observable and measurable.

__TASK__ 2. Calculate firing data for the MK-16 torpedo. The product (firing data) for this task is observable.

__TASK__ 3. Troubleshoot suspension system. This task can be observed during its performance. The results can be measured.

__TASK__ 4. Apply first aid measures to a chemical casualty. This task can be both observed and measured during the performance.

_____ 5. Understand battle tactics. It is impossible to observe or measure someone in the act of "understanding."

_____ 6. Perfo w inventory control duties. This is probably a duty area (the word "duties" is a big hint). It is difficult to observe and measure the performance of an entire duty, although we can observe and measure the tasks which make up a duty.

__TASK__ 7. Process special request/authorization (NAVPERS 1336/6). This is a task. Its performance is both observable and measurable.

Structure of a Task Statement

The statement of a task is composed of three basic elements: (1) a specific action verb, descriptive of what is done; (2) a brief identification of what is being acted upon--the object of the action verb; and (3) whatever qualifying phrases that may be needed to clearly distinguish the task from related or similar activities, to limit and define the scope of concern, or to communicate unambiguously what task it is.

(1)   (2)   (3)

ACTION VERB + OBJECT OF ACTION VERB (NOUN) + QUALIFIER (if essential to the meaning)

Thus, task statements are simple declarative statements. They typically start with an action verb in the present tense, with the subject of the sentence understood to be "I" (so that the statement makes personal sense to a job incumbent who may be asked about what he or she does on the job). The following are examples of task statements, with several showing the use of meaningful qualifiers.

ACTION	+	OBJECT OR ELEMENT BEING ACTED UPON	+	NECESSARY QUALIFIER
Counsel		work center personnel		on career advancement
Hook		tow bars		to aircraft
Isolate		faulty circuit		in ballistic missile
Lubricate		analog computer		
Paint		flight deck markings		
Type		letters		of reprimand/admonition

PRACTICE EXERCISE

Identify the tasks in the following list.

_____ ✓ 1. Compute latitude and longitude from fix information.

_____ 2. Know foreign policy.

_____ 3. Turn off buzzer.

_____ ✓ 4. Calculate loads.

_____ ✓ 5. Measure point-to-point distances on a map.

_____ 6. Adjust gauges.

_____ ✓ 7. Correlate lookout/radar information with CIC plots.

Check your responses with the feedback on the next page.

FEEDBACK

__TASK__   1. Compute latitude and longitude from fix information.
This is a task. It is specific and written in the
verb/object format. The qualifier "from fix infor-
mation" makes the statement more specific than simply
saying "compute latitude and longitude."

_____ 2. Know foreign policy. This is not a task. The verb
"know" can mean many things to different people. It
is not specific enough to be used in a task statement.

_____ 3. Turn off buzzer. This is not a task. It may be a
step in performing some task.

_____ 4. Calculate loads. This is not a task. This statement
is not specific enough to qualify as a task. The
statement could be improved by qualifying what type
of loads are calculated, for example, calculate loads
for cargo nets.

__TASK__   5. Measure point-to-point distances on a map. This is a
task. Note how "point-to-point distances" is better
than just "distances" and how "on a map" makes the
task statement more specific.

_____ 6. Adjust gauges. This is not a task. The statement
does not specify the type of gauge to be adjusted.

__TASK__   7. Correlate lookout/radar information with CIC plots.
We would call this a task. It is specific, observ-
able, and measurable.

General Guidelines for Writing Task Statements

In constructing, reviewing, and editing the task statements of a NOTAP task inventory, three considerations should be kept in mind: First, the purposes·to be served by the information obtained; second, the individual whose job is being surveyed and who will complete the inventory; and finally, the format to be used so that the data collected can be analyzed by the Comprehensive Occupational Data Analysis Programs (CODAP).

Purposes To Be Served by Task Information. Each task statement should be written in the context of the uses to be made of the information derived from it. In general, the statement should serve one or both of the following purposes.

- The task statement should elicit responses that differentiate between workers in different job types within the enlisted rating.

- The task statement should elicit responses that differentiate between managers and supervisors, supervisors and journeymen, and journeymen and apprentices.

The Job Incumbent Responding to the Task Statements. In considering the job incumbent who responds to the task inventory, each task statement should conform with the following ground rules.

- The task statement must be clear so that it is easily understood by the job incumbent.

- The task statement must be stated using terminology that is consistent with current usage in the enlisted rating. Avoid overly technical jargon and obsolete terms.

- The task statement should be brief to save reading time of the respondent.

- The task statement must be unambiguous so that it has the same meaning for all job incumbents in the rating.

- Abbreviations must be used cautiously since they may not be understood throughout the rating. It is good practice to spell out the term and follow it by the abbreviation in parentheses where it first appears in the inventory. In later usage, the abbreviation may stand alone. However, it is best to avoid abbreviations whenever possible.

- The task statement must be worded so that the task rating scales make good sense when applied to it.

- The task statement must be ratable in terms of time spent and other rating factors. This eliminates skill, knowledge, and responsibility items that begin with such words as "Have responsibility for...," "Know how to...," "Understand...," "Have knowledge of...." Such statements found in source materials should be written as two or more activity task statements (e.g., "Set up filing system" or "Maintain files" NOT "Have responsibility for maintaining files").

- Vague or ambiguous verbs should be avoided if possible. The following verbs and verb phrases may be considered vague or ambiguous, depending on how they are used. Typically they indicate a lack of precision in stating what work activity is intended by the statement.

Account for	Coordinate	Produce
Answer	Establish	Provide
Arrange for	Forward	Receive
Assist	Handle	Recommend
Assume	Implement	Resolve
Assure	Initiate	Responsible for
Attend	Insure	Serve as
Check	Maintain liaison	Store
Communicate	Monitor	Submit
Confer with	Participate in	Support
Contribute to	Process	Work closely with
Control		

Consult the list of standard NODAC action verbs contained in Appendix C when you have a choice of verb to make or when you are searching for an acceptable synonym for a vague or ambiguous verb.

- Short words should be used in preference to long words or expressions (e.g., "Write production and control reports" NOT "Accomplish necessary reports involved in the process of maintaining production and control procedures").

- When a task concerns the completion of a form, the task statement should be written to include the verb, then the exact title of the form, and finally the form number in parentheses (e.g., "Prepare advancement worksheet (NAVPERS 1430/2)").

Task Statement Format To Facilitate Analysis. Each task statement must appear in a format that is consistent with a functional orientation and is compatible with the computer programs (CODAP System 80) that have been developed to analyze the data obtained. The following guidelines should be followed.

- Task statements should be limited to 240 characters and not more than four lines, each containing a maximum of 60 characters.

- Each task statement must be specific and capable of standing alone. An item such as "Operate other types of equipment" is meaningful to a job incumbent if listed at the end of a series of "Operate...equipment" tasks. However, later, in the consolidated job descriptions to be prepared from the results, the tasks are not printed in the same order as in the inventory. Thus, the original context is destroyed, and an item like "Operate other types of equipment" cannot now be interpreted.

- Each task statement must be a complete sentence. Do not use an action subheading followed by a series of objects. For example:

    USE: 1. Balance shafts
           2. Balance rotors
           3. Balance gears

    NOT: Balance the following equipment:

           1. Shafts
           2. Rotors
           3. Gears

- The period at the end of a task statement is omitted.

- Use "such as" followed by two or three examples. Avoid "and/or" and "etc." (e.g., "Weight test lifting gear such as strongbacks and slings," NOT "Weight test lifting gear such as strongbacks and/or slings, etc." or "Weight test lifting gear (strongbacks, slings, etc.").

- If separate supervisory tasks are included in the inventory, each task being supervised should almost certainly have a related task which is performed. Also, equipment being inspected probably will have some kind of maintenance task performed.

- Use simple statements without qualifiers unless the qualifier is essential to the meaning of the statement (e.g., "Use X-Y plotter" NOT "Use X-Y plotter to plot X-Y coordinates" but "Manufacture outriggings for booms and gangways" NOT "Manufacture outriggings").

  In general, there are four different types of qualifying phrases/ modifiers: (1) multiple ways of doing a task (e.g., digging a firebreak by hand, using a backhoe, or using a bulldozer); (2) multiple purposes for performing a task (e.g., check Widgit XYZ for evidence of overheating, metal fatigue, or physical damage); (3) stating the scope of the task (e.g., supervise <u>hands-on on-the-job training (OJT)</u>..., lecture <u>large groups</u> of recruits in basic training, or give news briefings <u>to the media</u>); and (4) stating where and under what conditions the task is performed (e.g., corrosion prevention tasks might differ near the salt spray of sea coasts as opposed to inland regions; or separate tasks may need to be stated for driving an official naval vehicle in dense fog, in a sand storm, or in the snow). Certain enlisted ratings [e.g., Aviation Boatswain's Mate (AB), Hospital Corpsman (HM) under battle conditions, and Torpedoman's Mate (TM)] may have more critical, nonroutine performance conditions than others [e.g., Personnelman (PN) and Yeoman (YN)] whose work is more predictable and less subject to nonroutine performance conditions.

- If a modifier is needed for greater specificity, be sure to include all other significant tasks with comparable modifiers. For example, in an automotive mechanic inventory, "Repair transmissions" would not be specific enough. Therefore, if the statement were modified to read "Repair automatic transmissions," then "Repair standard transmissions" and "Repair transmissions with overdrive" should also be added.

- Avoid tasks that are obviously too specific or trivial (e.g., "Operate fork lift" NOT "Turn ignition key," "Shift gears," or "Elevate fork"). These three are subtasks or steps in the task, not tasks in themselves.

- Avoid tasks that are too general. Such tasks will not differentiate job types (e.g., "Repair carburetors" or "Repair standard transmissions" NOT "Repair motor vehicles").

- In general, avoid multiple verbs in a task statement unless several actions are invariably performed together (e.g., "Adjust/align optical equipment" or "Remove/replace relays" but NOT "Witness, document, and verify reinstallation of electrical equipment on nuclear submarines").

- In general, avoid multiple objects acted upon unless several objects or elements are invariably acted upon together by the job incumbent (e.g., "Lubricate front and rear suspension" but NOT "Adjust carburetors, brakes, and headlights"). Multiple objects used to clarify or give examples of a type of object acted upon are acceptable (e.g., "Order typewriting supplies such as ribbons, carbon paper, and correction fluid").

- As far as possible, tasks included in the task inventory should be independent (mutually exclusive of every other task statement in the inventory). Avoid overlapping task statements such as the first task being one step in the performance of some other task (e.g., "Solder multiconductor wiring" might be one step in the task "Fabricate interconnecting cables").

- As far as possible, all task statements in a task inventory should be written at the same level of work specificity.

- Avoid redundant qualifying phrases such as "when appropriate," "as required," or "in accordance with prescribed directives" (e.g., "Maintain logs" NOT "Maintain necessary logs in accordance with prescribed naval or local regulations and directives"). These phrases are often found in source materials but serve no useful purpose in task inventories.

- Do not use semicolons (;) because they are delimiters in the CODAP System 80 control language. The following signs are permissible:

+	Plus	,	Comma	(	Open Parenthesis
-	Minus	:	Colon	)	Close Parenthesis
/	Diagonal	.	Period	$	Dollar Sign
=	Equals	'	Apostrophe	&	Ampersand
		*	Asterisk		

Always use commas before conjunctions in a series (e.g., "Weld high, low, or medium carbon steel").

PRACTICE EXERCISE

Indicate which of the following action descriptions are tasks because they have all the necessary characteristics of a task statement.

_____	1. Troubleshoot radar antenna motion system to major component.
_____	2. Have knowledge of correct repair procedures.
_____	3. Change windshield wiper blades.
_____	4. Conduct traffic investigations.
_____	5. Assure work center morale.
_____	6. Inspect aircraft for hot brakes.
_____	7. Align receiver for maximum sensitivity.
_____	8. Understand nuclear weapons.
_____	9. Perform military duties.
_____	10. Jack up vehicle.
_____	11. Operate winch on the ABC cargo loader.
_____	12. Perform artificial respiration using the mouth-to-mouth method.
_____	13. Solder various components.
_____	14. Chop vegetables.
_____	15. Enforce regulations.
_____	16. Disseminate results of Captain's Mast.

Check your responses with the feedback on the next page.

FEEDBACK

__TASK__ 1. Troubleshoot radar antenna motion system to major component. This is a task. It is a specific action with a beginning and end.

_____ 2. Have knowledge of correct repair procedures. There is no definite beginning and end to a person's "knowledge" of something.

__TASK__ 3. Change windshield wiper blades. This is an activity that can be performed over an observable and measurable short period of time.

_____ 4. Conduct traffic investigations. This is probably a duty area.

_____ 5. Assure work center morale. "Assure" is such a broad term that we cannot say it has a definite beginning and end.

__TASK__ 6. Inspect aircraft for hot brakes. This is a task. It is a specific action, has a beginning and end, and can be performed over a short period of time.

__TASK__ 7. Align receiver for maximum sensitivity. This is a task. It is a specific action qualified by the modifier "for maximum sensitivity."

_____ 8. Understand nuclear weapons. It is impossible to tell when someone's "understanding" begins and ends.

_____ 9. Perform military duties. This is a vague statement. At best, it is a duty area.

_____ 10. Jack up vehicle. Most likely this is an element of some task such as "rotate tires" or "change flat tire." Ask yourself why workers would jack up a vehicle unless they were in the process of doing something that required this action.

__TASK__ 11. Operate winch on the ABC cargo loader.

__TASK__ 12. Perform artificial respiration using the mouth-to-mouth method.

_____ 13. Solder various components.

_____ 14. Chop vegetables.

_____ 15. Enforce regulations.

__TASK__ 16. Disseminate results of Captain's Mast.

Describing Supervisory, Managerial, and Leadership Tasks

One of the more challenging efforts in task inventory construction is stating the tasks performed by supervisory and managerial personnel in an enlisted rating or officer specialty. Information processing and communication functions are common features of many jobs dealing with the supervision or management of personnel. However, it is insufficient to state generally that supervisors "Supervise subordinate personnel," "Control flow of work," "Monitor safety programs," "Supervise training programs," or "Attend meetings."

Several tasks need to be generated to describe what observable activity is being done in accomplishing each general function. For example, instead of stating, "Counsel personnel," it should be possible to identify such component tasks as:

1. Counsel personnel on pay and allowances.

2. Counsel personnel on financial problems.

3. Counsel personnel on correspondence courses.

4. Counsel personnel on overseas transfer.

The goal is to describe the actual, <u>observable</u> activities that must be performed to accomplish each supervisory, managerial, or leadership function. In some cases, the job activities may not be readily discernible by a person other than the worker. Even though these activities are not readily observable, there should always be an observable outcome, end product, or service. It is through these observable outcomes, end products, or services that you <u>infer</u> that some mental behavior has in fact occurred.

Supervisory, managerial, and leadership tasks often use action verbs of a more mental rather than physical nature. Consequently, these tasks will more likely reflect such appropriate and relevant actions as:

Appraise	Counsel	Guide	Process
Approve	Decide	Inform	Recommend
Assign	Determine	Interpret	Review
Chair	Draft	Investigate	Schedule
Check	Estimate	Lead	Set
Compare	Evaluate	Negotiate	Study
Conduct	Explain	Plan	Submit
Contact	Forecast	Predict	Verify

PRACTICE EXERCISE

Write several (4-5) task statements that describe supervisory tasks you perform in your job. If you are not a supervisor, describe tasks that your supervisor performs. Then show these task statements to a co-worker or your supervisor. Rewrite any task statements that need revision. Use the space below for writing your task statements.

1. Counsil Personell on various Educational opportunities available within the Navy C

2. Conduct Weekly Personell Inspection

4. counsel Personell on their performance

3. assign Personell to various tasks.

5. Evaluate Personell Performance

Recognizing Faulty Task Statements

Several kinds of errors commonly occur in the stating of tasks. These problem areas need special attention to assure effective statements of each task of an enlisted rating, consistent with their intended use in occupational surveys. Six of the most common faults are the following.

- More than one task in a single statement.

- Activity is stated as a general function or responsibility.

- Unclear statement of the action.

- Overly dependent upon duty context for meaning.

- Too many limits placed on how the task is performed.

- Substitution of method of performance for the task itself.

Each of these typical faults is explained and illustrated in the pages that follow, using examples from three occupations—Automotive Mechanic, Business Data Programmer, and General Secretary. These examples should be useful in training task inventory developers to state tasks, to assess the merits of statements previously prepared and made available by other agencies, to review statements prepared in-house, or to use as standards against which to compare statements for possible faults.

The material presented in the pages that follow is taken from the following source:

Ammerman, H. L., & Pratzner, F. C. <u>Performance content for job training: Stating the tasks of the job</u> (R&D Series No. 122, Vol. 2). Columbus, OH: The Ohio State University, The Center for Vocational Education, March 1977, pp. 39-43.

FAULT: *More than one task in a single statement.*

Task statements including multiple job activities may make it impossible to determine which activity is associated with task survey data or is of training concern. They may also confuse survey respondents who would prefer to rate each activity differently, such as when one of the activities is performed by another type of worker or its job significance differs quite a bit from the other work cited in the statement.

Variations of this fault are:

1. Use of more than one action verb.
2. Use of more than one object acted upon.
3. Linkage of several tasks in one compound sentence.

EXAMPLES OF FAULT

More Than One Action Verb:

- Test and rewire electrical dash units.
- Inspect and replace defroster hose.
- Adjust, repair, or replace back-up light switches.
- Repair or replace wheel cylinder.
- Plan and conduct on-the-job training of data processing procedures.
- Review and prepare cost estimates of equipment use
- Edit and review a report.
- Select or order furnishings for office.

More Than One Object Acted Upon:

- Repair ignition switch, resistor, wiring, coil points, and condenser of the primary circuit.
- Lubricate vehicles and equipment.
- Prepare cost report or cost estimate for data processing equipment.
- Prepare a briefing or visual presentation.
- Evaluate files, reports, or correspondence.
- Develop procedures for the maintenance of news files and reference libraries.

Separate Tasks Joined in One Sentence:

- Pressure test, performance test, and leak test the air conditioning system.
- Inspect vehicles and apply materials for corrosion and rust control.
- Analyze core dumps, evaluate, and recommend solutions.
- Plan programming work loads, make work assignments, and organize shifts.

- Perform system generation, establish source and relocatable library sizes, etc.
- Order all publications and keep track of subscriptions.
- Make list of contents of office safe and keep it up-to-date.

ACCEPTABLE USE OF SOME MULTIPLE ACTIONS AND OBJECTS

Composites of more than one action verb or object acted upon are acceptable and appropriate in a single task statement when they:

1. Tend to occur together as a whole unit of work.
2. Serve to clarify a single type of work activity, and reasonably involve the same training.

Examples of Acceptable Tasks:

- Clean, gap, and test spark plugs.
- Locate and repair short in wiring.
- Clean engine parts and check for condition.
- Lubricate front and rear suspension.
- Replace hydraulic lines and fittings.
- Inspect drive shaft, U-joints, and center bearings.
- Fold and insert letters in envelopes.
- Inspect money orders and checks as to amount, dates, signatures.

- Inspect material received for completeness and damages.
- Record time card or time clock data on payroll forms.
- Stuff, bundle, sort, and/or label outgoing mail.
- Address letters and packages.

FAULT: *Activity is stated as a general function or responsibility.*

Statements of general work functions or job responsibilities do not provide adequate specificity for use in making decisions about training content. They also confuse raters of task performance surveys because a variety of tasks enter into the accomplishment of the function or responsibility. Typically, such general activities are of an ongoing nature in a job assignment, with no definite ending or times of performance.

EXAMPLES OF FAULT

- Maintain washrack equipment.

- Train individuals on the job.

- Resolve technical problems.

- Monitor safety programs.

- Prepare forms and correspondence.

- Do preliminary work for income tax return.

- Supervise clerk typists.

- Control and manage filing system.

- Act as cashier or teller.

- Perform operator maintenance on ADP equipment.

- Identify problem areas in the system.

- Perform non-linear programming.

- Evaluate deviations from standards.

- Optimize program execution times.

- Supervise documentation of programs.

- Design operating systems.

- Coordinate scheduling of machine work load.

- Maintain current run tapes.

FAULT: *Unclear statement of the action.*

General or vague action words for task statements do not allow
the person providing task ratings to be certain of the intended
meaning of the statement. Nor can the person interpreting the
training implications of such ratings be certain of what work
activity the rater had in mind. Occasionally it is possible to
clarify a task by including its purpose or the method to be used.

EXAMPLES OF FAULT

- Inspect lubrication and service guide.
- Follow-up on requisitions.
- Perform road service.
- Check exhaust systems.
- Review records for compliance with labor laws.
- Inspect steering.
- Correct bearing fit.
- Coordinate with staff in the development of new systems.
- Extract figures needed for special analyses.
- Make switch settings.

- Exploit parallel processing capabilities.
- Develop subroutines.
- Trace mail.
- File materials.
- Extract information from files.
- Implement employer's directives.
- Help organize office or company committees
- Make preparations for meetings.
- Keep card indexes.

FAULT: *Overly dependent upon duty context for meaning.*

While brevity is desired in task statements, sufficient description of a task activity must be included to permit the task to be reasonably meaningful when not grouped with functionally related tasks. This might be necessary when subsequent analyses rank the tasks on some issue.

EXAMPLES OF FAULT

- Performance test the system.
- Complete unsatisfactory reports.
- Evaluate suggestions.
- Replace system regulators.

- Evaluate deviations from standards.
- Plan layout and makeup.
- Make out monthly statements.
- Diagnose malfunctions.

FAULT: *Too many limits placed on how the task is performed.*

Though task modifiers are sometimes useful to clarify the meaning of an activity statement, some modifiers may be unduly prescriptive and place too many unnecessary limits upon the intended performance statement.

Variations of this fault are:

1. Stating how often or when a task is to be performed.
2. Use of all-inclusive terms, such as "all," "every," "always."

EXAMPLES OF FAULT

Stating How Often or When:

- Change dates on time stamp machine or calendar daily.
- Prove cash daily.

Use of All-Inclusive Terms:

- Initiate all computer operating notes, technical bulletins, etc. for job performance improvements.
- Order all publications for library.

FAULT: *Substitution of method of performance for the task itself.*

Stating how a task is performed, with the actual task sometimes following as a modifier of the method, causes the emphasis to be misplaced. This can lead to undue attention upon the method instead of upon the work activity as the training objective. It also may cause uncertainty as to which part of the statement a survey respondent is attending. And, there may be a tendency to omit the task activity altogether, stating only the method of performance. The same problem occurs when the purpose of an activity is substituted for the task to be performed.

EXAMPLES OF FAULT

- Write shorthand.
- Work with operations supervisor to determine best operating procedures to be followed.
- Optimize program execution times.
- Resolve technical problems.

- Incorporate standard routines into programs.
- Use linear programming techniques.
- Control system input and output.
- Perform analog programming.

HANDBOOK FOR CONSTRUCTION OF TASK INVENTORIES

FOR NAVY ENLISTED RATINGS

APPENDIX E

HOW TO CONDUCT JOB

ANALYSIS INTERVIEWS

HOW TO CONDUCT JOB ANALYSIS INTERVIEWS

This appendix was prepared to help first-time interviewers develop enough skills and experience so that they will be ready to participate in O&I trips. Individuals who have had some interviewing experience will also find it helpful for review and for learning more about the specific skills required for job analysis interviews.

Practice exercises are spaced throughout the appendix to help you apply what you are learning. If you are a new interviewer, you will want to have your own copy of this appendix so you can work the practice exercises. Most of the exercises have feedback following them, so you can work through them by yourself. For others, you will need the help of a coworker or your supervisor. Time spent working on these exercises will make your first interviews easier to do.

Introduction to Interviewing

Interviews are more than mere conversations. They are planned dialogues about specific subject areas, conducted and controlled by an interviewer. In addition, each interview is conducted for a specific purpose. For job task analysts, that purpose is to gather data about some parts of a job. The kinds of data that may be collected by job task analysts are listed below:

- Information about the duties performed.

- Information about the systems and equipment used on the job.

- Descriptions of job-related tasks and work activities.

- Descriptions of operator/maintenance activities performed on a new weapon or equipment system.

- Documentation of training deficiencies, the differences between what a worker has been trained to do and the actual requirements of the job.

- Descriptions of job supervisors' estimates of the actual requirements of the job.

- Descriptions of the population performing the job.

Planning for the interview begins when the specific purpose of the interview is determined. While all interviews conducted by analysts are for the purpose of collecting job information, the ones you conduct for NODAC have a more specific purpose, to develop items for revising NOTAP surveys. For example, information may be needed on tasks that are not described in existing resource documents, or on new equipment or procedures. Special areas of interest for each rating will be discussed during the O&I Predeployment Meeting.

PRACTICE EXERCISE

Describe in your own words the purpose for conducting job analysis interviews in your rating.

State your answer in the space below.

Check the feedback on the next page.

Your reasons for conducting job analysis interviews will depend on the current problems in the rating. Here are some general reasons for conducting interviews:

- Need to add information to incomplete descriptions of duties.

- Need for information on a new system.

- Need to determine how much change has occurred in a rating since the last survey.

Any questions? If so, check with your supervisor.

Three types of skills are required in a good interviewer—asking questions, listening, and observing. Although asking the right questions is critical to the success of an interview, being an active listener and an alert observer are important as well. This appendix will give you information and practice to help you develop each type of skill.

Asking Questions

Asking questions is the active part of interviewing. The interviewer must know what to ask and how to ask it to get the best information. He or she must be able to begin the interview by establishing rapport, move the interview along to cover the required material and keep it on track, and close the interview when the information has been gathered. To do this, good interviewers use many different techniques. The particular techniques used depend on the preferences of the interviewer and the requirements of each individual interviewing situation. Using these techniques does not guarantee success, but it does increase the likelihood that useful information will be gathered.

Developing Questions. Before you begin an interview, you will want to prepare, at first on paper, and then in your mind, a series of general questions that could be used to obtain job information. Different questions will be needed, depending on the specific purpose or purposes of the interview. In most interviews, you will not want to read this prepared list of questions. As you gain experience you will not need it, and using it may interrupt the flow of the interview or not allow you to take advantage of asking about what you observe. The more practice you get preparing questions

ahead of time, however, the easier it will be for you to ask good questions during the interview itself.

The questions must clearly communicate the intended meaning by using correct job-specific terms at appropriate times. Here is an example of questions which might be asked during a typical O&I interview:

- What are the major duties of your position?

- What exactly do you do in each of them?

- What tasks do you perform in an emergency drill?

- Who is responsible for doing preventive maintenance on this equipment?

PRACTICE EXERCISE

Imagine you are going to inverview several job holders about a duty category in your rating. Make a list of at least six questions you would use to collect information about the tasks performed in that duty.

If you had the answers to these, would you have a complete picture of what is done? What else would you need to ask?

E-4

Techniques for Asking Questions

1. Ask only <u>one</u> question at a time.

2. Begin with an easy topic.

   - Avoid dealing initially with complex topics.

   - Gradually work from simple to complex topics.

3. Use appropriate vocabulary level.

   - Avoid impressing the interviewee with your vocabulary.

   - Avoid talking down to the interviewee.

4. Avoid leading questions.

   - Avoid questions that hint at an expected outcome.

   - Avoid questions that place the interviewee in a "no win" situation.

EXAMPLE

"Are you still behind on your reports?"

Leading questions usually begin with "Don't you agree that ...." or Aren't you in favor of ...." Any question that begins with a loaded phrase or otherwise causes the subject to give a particular answer is a leading question. Such questions almost force the person to agree with the interviewer. These questions seldom reveal useful information and usually destroy any existing rapport.

5. Use comparative questions.

   - Helps to focus the interviewee's attention on relevant topics.

   - Useful for discovering things the interviewee finds difficult or distasteful.

EXAMPLES

"Which do you perform first—A or B?"

"Which procedure is easier to perform—A or B?"

6. Use indirect open-ended questions

   ● Avoid questions that can be answered with only a "yes" or "no."

   ● Subtle questions are preferred over sharp, direct questions.

   ● Open-ended questions leave the interviewee with a free choice of answers.

                              EXAMPLES

      "Tell me about ...."

      "What would you do if ....?"

   ● Avoid hypothetical questions like, "If you were the Commanding Officer of the ship, what would you do to improve or change this?"

7. Explore the interviewee's reason for an answer.

   ● Probe to bring out evidence and reasons.

    › Avoid taking answers at face value.

8. Avoid reading facts or questions from a form.

9. Ask encouraging questions.

   ● Help direct the interviewee's thought toward a specific area.

   ● Indicate to the interviewee that more information is needed.

                              EXAMPLES ·

      "Tell me more about ...."

      "I'd like to hear more about that."

10. Use pause and silence.

    ● Avoid talking every time the interviewee stops talking.

    ● Give the interviewee time to respond to a question before speaking.

Beginning the Interview. Begin to establish rapport with the inter-viewee as soon as you make contact. Your greeting should be friendly and

pleasant. Remember that you serve as an ambassador for NODAC to the operational Navy. Their cooperation, which is required for NODAC to do its job, depends on how professional and courteous you are with them.

Most people are somewhat tense at first, especially if they do not know why they are being interviewed. Do not assume that the interviewees have been told by their supervisor why they were selected. Begin with a few sentences explaining what NODAC is and why you need to collect information from them. Here is an example of what you might say:

EXAMPLE

I am here from the Navy Occupational Development and Analysis Center to interview you to find out what people in your rating actually do on the job. This information will help us develop a survey that will go to a large number of people in your rating. Perhaps you took one of these NOTAP surveys when it was given four years ago?

The Navy needs to know what people are actually doing on the job so the training people can train for the right things in A-School, and people come to you better trained. The information is used to write occupational standards which are used to develop rate training manuals and advancement exams. Sometimes the information is used to combine two service ratings or create a new rating. So, you see, the information you provide us is very important.

Allow the interviewees time to ask questions about the interview.

In addition to explaining the purpose of the interview, you can help establish a good relationship with the interviewee in many other ways. The following is a list of some other things you can do:

- Talk to the interviewee at his or her level. Avoid using an impressive vocabulary.

- Use appropriate technical language.

- Sit facing the interviewee and maintain eye contact.

- Be courteous. Never tell the interviewees how to do their jobs.

- Begin with an "easy to talk about" topic.

- Be honest in your answers to interviewees' questions.

- Use a minimum of examples from your own experience or "sea stories." Although they are a common technique for establishing and maintaining rapport, too much use of them can waste everyone's time.

• When interviewees hear that you are from Washington, they
often ask questions or complain about some matter that is
unrelated to job analysis. Politely listen to them, and
give them information (such as detailer's phone number)
that will let them know you are interested in helping
them, but that you are really not the person who can solve
their problem. As soon as possible, guide the interview
back to the appropriate topic.

PRACTICE EXERCISE

List some of the techniques you would use to establish rapport
with an interviewee. Include a brief summary of the purpose for con-
ducting the interview.

Check the feedback on the next page.

Here are some of the techniques you could use to establish rapport:

- Talk to the interviewee at his or her level. Avoid using an impressive vocabulary.

- Use appropriate technical language.

- Sit facing the interviewee and maintain eye contact.

- Be courteous

- Be honest in your answers to an interviewee's questions.

Do you have others?

Your summary of the purpose for conducting the interview should include information about

- What NODAC is

- How interviews are related to NOTAP surveys

- How the Navy uses the information

Any questions? If not, continue.

Maintain Control of the Interview. Most interviews will be useless if you cannot direct the flow. Try to use only the minimum amount of control necessary to keep the interview flowing smoothly and on the appropriate topics. Avoid excessive controls because they tend to place stress on the interviewee. Using the following pointers should help you conduct successful interviews:

1. Avoid interrupting the interviewee.

   - Hurts rapport

   - Cuts off a chain of thought

   - May antagonize the person

2. Use pause or silence.

   - This helps to avoid a steady stream of conversation.

   - Gives both interviewer and interviewee time to think.

3. Handle delicate issues carefully and as opportunity occurs.

   ● Avoid open discussion of personal affairs, politics,
     etc. that may cause distress, embarrassment, or
     emotional reactions.

   ● Try to understand what the interviewee is saying or
     feeling even if you do not agree with it.

4. Be flexible.

   ● Adapt to situations quickly.

   ● Avoid rigidly using a predetermined format or plan.

5. Avoid bias.

6. Avoid correcting or ridiculing the subject.

   ● Destroys rapport.

   ● Does not contribute to the collection of data.

7. Work from general topics to specific topics.

8. Manage silent and open hostility.

   ● Recognize when the interviewee is alienated or upset.

   ● Encourage the interviewee to open up and express his
     or her point of view.

   ● Try to summarize the points of disagreement.

   ● Listen to opposing ideas with respect.

   ● Allow the interviewee to ventilate his or her feelings.

   ● Avoid taking sides in a disagreement.

   ● Finish the interview quickly and go on to someone else
     if the person continues to be hostile. Remember to
     thank the person, anyway.

PRACTICE EXERCISE

You have established good rapport with the interviewee. However, as you start to discuss an area for which you need information, she begins to evade questions. She appears somewhat irritated at the questions. This is an important topic and you need the data. Describe the questioning techniques you would use to collect this data. Use the space below to explain why you would use these techniques.

Check the feedback on the next page.

FEEDBACK

Here are some questioning techniques you could use to collect data from an interviewee who is evading questions:

- Use comparative questions--Ask "Which procedure do you perform-- A or B?"

- Use indirect open-ended questions. Say "Tell me about the tasks you perform in duty position A."

- Ask encouraging questions. Say "I'd like to hear more about the tasks you perform when you operate vehicle Y."

Review the list to identify other techniques you could use. If you have any questions, ask your supervisor.

PRACTICE EXERCISE

You have been assigned to interview several workers in one shop. Earlier you overheard them discussing their feelings about having to stop work to be interviewed. Several appeared very annoyed at being taken away from their work when they were busy. The Chief said he had planned to take off that afternoon. He said this interview stuff is a lot of bull and he will not cooperate. How would you handle his potential hostility during the interview?

State your answer below.

Check the feedback on the next page.

FEEDBACK

Here are some ways you might control someone's hostility during an interview.

- Explain why the information is important and how it will be used.

- Let the interviewee talk and "blow off steam."

  - Do not interrupt

  - Do not ridicule

  - Use silence

- Listen to his or her ideas.

- Try to focus the interview on the subject at hand.

Concluding the Interview. Knowing how to end an interview is as important as knowing how to begin it. Once started, people like to talk about their jobs, and they often have many things to tell the people from Washington. When you think you have covered just about all your questions, bring the interview to a close. Be certain not to run over into people's lunch hour or free time. You will want to review your notes to make certain you have covered everything, as well as give the interviewee an opportunity to add points at the end. Remember to thank the interviewees for their time and tell them how helpful they have been in assisting the Navy in learning more about what people actually do on the job.

Active Listening

Getting the Interviewee to Talk. Listening is more than just not talking. It is the part of the interview where you learn the information you need. The opportunity to get this information occurs only when the interviewee talks. The first step in active listening, then, is to ask questions in such a way that the interviewee does most of the talking.

EXAMPLE

A question such as "Do you use all the equipment in this room to do your job," can be answered with a simple "Yes" or "No." A question such as "Which pieces of equipment haven't been used in the last year?", followed by "Why not?" makes the interviewee give more information.

E-13

<u>Restating and Summarizing</u>. Although you may listen intently, sometimes answers to questions may not be clear or may not give you the needed information. Lack of clarity may be due to the interviewee's lack of understanding of the question or his or her use of jargon or slang with which you are not familiar. When this happens, test your understanding of what has been said by restating it in the simplest language possible. When you have finished with a task or group of tasks, summarize what has been said to make sure you understand it.

<div align="center">EXAMPLES</div>

"If I understand you, you're saying.........."

"Let me see if I have it straight. There are five steps in the process, and different people do each step."

<u>Using the Time Gap</u>. Concentration during listening is more difficult than during most other human activities. The reason for this is that we think about six or seven times as fast as we talk. When we listen, therefore, we continue thinking at a high speed while the words we are listening to arrive at a low speed. In other words, we can listen and still have considerable spare time for thinking. How well we use this spare thinking time makes the difference between listening effectively or poorly.

Good listeners perform four mental activities while listening. These activities are well coordinated and direct attention to the message being received. Little time is left for day-dreaming or side excursions leading away from the speaker's thought. The four helpful activities are:

- Think ahead of the speaker and try to anticipate where the conversation is heading and what conclusions will be drawn from the words spoken at the moment.

- Weigh the evidence used by the speaker to support the points being made, asking mentally, "Is this point valid? Is the evidence complete?"

- Throughout the conversation, "listen between the lines" for meaning not necessarily spoken. Do this by paying close attention to nonverbal signals, facial expressions, gestures, tone of voice, and emphasis to see if they alter the meaning in some way.

- Periodically review and mentally summarize the points presented.

The time gap created by the difference in speeds of talking and listening permits plenty of time to accomplish these four mental tasks. However, they do require practice before the habit of listening effectively can be acquired.

PRACTICE EXERCISE

You are interviewing someone from a rating very different from yours. He uses a lot of technical jargon that does not make sense to you. You find your mind wandering. What should you do? Write your answer in the space below.

Check the feedback on the next page.

FEEDBACK

Here are some things you can do to keep your attention on the speaker.

- Ask the interviewee to explain terms you do not understand.

- Mentally summarize and outline what is being said as the interview proceeds.

- From time to time, stop and summarize for the interviewee your understanding of the job. Ask additional questions until you have it right.

- Think at two levels--what is being said, and how it fits into your larger picture.

- Listen for clues to whether you are being told how tasks are supposed to be performed or how they are really done.

- Practice keeping slightly ahead of the speaker.

Observing People on the Job

Good interviewers use their eyes as well as their ears to gather job-related information. Careful observations of people at their work help interviewers ask good questions, gather more complete data, and check the validity of what people say they do.

EXAMPLES

A torpedoman's mate says he has told the interviewer about all of his duties. The interviewer sees a chain fall rigged in the spaces. When the interviewer asks what it is used for, the torpedoman's mate describes a whole series of tasks he forgot to mention.

At the start of an interview, an electronics technician describes her job in very general terms, "We repair radar equipment, whatever kind they send us." The interviewer looks around the shop and asks, "What do you do with this equipment?"

A Chief has just told the interviewer, "We don't do any paper work in this shop. That's done by the supply office." The interviewer observes someone at a workbench filling out a form, and asks the Chief about it.

As an interviewer, you will have many opportunities to observe people. In addition to observing people while you interview, you will have opportunities to observe while waiting for interviewees, while touring spaces, and going and coming at the command. Pay special attention to:

- What, specifically, people are doing.

- Who, by rating and pay grade is doing the task.

- What equipment is being used.

Two factors are especially important in being a good observer. They are paying attention and being aware of how much characteristics of the observer (YOU!) affect what you observe.

Paying Attention. Any observer must learn to pay attention. How is this done? Here are three requirements:

- Place yourself in a state of readiness to observe specific task-related facts and to ignore other facts.

EXAMPLE

An interviewer is observing a mechanic perform an installation task. About halfway through the performance of the task, the interviewer begins to wonder about putting in a suggestion to change the installation procedure.

Although your suggestion about a new procedure may be a good idea, you may have missed some important information while you were thinking about it. Don't let your attention wander from the interviewee.

- Become interested yourself in the job and task area to be observed. This helps you watch with an active inquiring mind, and directs your attention. To cultivate your own interest, read about the job, and think about how it fits into the Navy's mission. Studying existing training material used by that rating is also helpful.

- Develop self-control so that observations can be made with minimal interference from the interviewer. Questions about a task and the requirements for its performance are an essential part of O&I. However, questions such as "Do you like working here?" are inappropriate, because they distract both the interviewer and the interviewee.

PRACTICE EXERCISE

In two or three sentences, tell how you would train and prepare
yourself to pay attention to tasks you observe. Write your sentences
in the space below.

Discuss your comments with a coworker. Now try it out.

Observer effects. When looking at the same object or action, everyone
does not "see" the same thing. When preparing to see what really is happen-
ing during an observation, remember:

- Past experience can cause an observer to jump to
  a conclusion.

- Anticipating an event can cause a false observation.

- Strong personal interests can cause the observer to
  see only those things he or she want to see, and
  overlook other information.

- Emotions, motivation, prejudices, mental sets, sense
  of values, or physical condition of the observer can
  affect the quality of the observation.

- A person tends to see what he or she knows.

PRACTICE EXERCISE

Get together with a coworker and observe some people on the job. Record what you observe.

FEEDBACK

Now compare notes and discuss the differences in what you each "saw." These differences are due to the differences in attention and background of different observers. What can you do to minimize these differences? One way is to be very clear about what you actually saw and what you inferred from your observations.

Interview Practice

In Appendix E, you have learned many specific techniques for conducting O&I interviews. More details about what to ask are included in Chapter 6, Step 10 of the Handbook itself. Before you go on an O&I trip, do one or more practice interviews until you feel at ease. The following exercise will help you put all the specifics together.

PRACTICE EXERCISE

Select one of the experienced interviewers at NODAC who is in a different rating from yours. Prepare some interview questions about what he or she did at his or her last duty station. Then conduct an information-gathering interview with him or her to learn about the tasks performed in that rating. In only one interview you will not be able to cover the rating completely. You may want to limit your discussion to one duty category only.

Using the "Self Evaluation" job aid in Figure E-1, rate yourself on your interviewing skills. You should use this check list after your first several interviews to help you improve your skills.

Self-Evaluation Check List

The following check list should be completed as soon as possible after your interview. It should be used as a feedback tool to improve your interviewing skills.

General	OK	Needs Improvement
1. Talking more than the interviewee	✓	
2. Being brief and concise		✓
3. Using open-ended questions	✓	
4. Thinking before talking	✓	
5. Using silence	✓	

Active Listening Skills	OK	Needs Improvement
1. Summarizing frequently		✓
2. Clarifying confusing issues		✓
3. Maintaining eye contact		✓
4. Reflecting what the subject says	✓	

Conducting the Interview	OK	Needs Improvement
1. Showing that you understand the subject	✓	
2. Using appropriate terms		✓
3. Allowing the interviewee to speak	✓	
4. Dealing with emotional issues	✓	
5. Avoiding criticizing the interviewee	✓	
6. Using encouraging questions	✓	

Controlling the Interview	OK	Needs Improvement
1. Keeping on the subject	✓	
2. Dealing with the person's anger or hostility	✓	
3. Avoiding "off the subject" remarks or conversations	✓	

Closing the Interview	OK	Needs Improvement
1. Allowing the interviewee to add items	✓	
2. Making sure you've covered everything		✓
3. Thanking the interviewee	✓	
4. Avoiding running on into free time	✓	

Figure E-1. Self-Evaluation Job Aid.

Why Interviews are Used

In performing job task analysis, NODAC uses both interviews and surveys. This is because both methods have advantages and limitations. Knowing them helps an analyst choose which method to use in any particular situation.

Advantages of Interviewing. Interviews provide opportunities to clarify and explain questions to the person being interviewed. The need to interpret and explain questions depends on the complexity of the questions and job area. People have few problems with questions that ask for recall of personal history or recent events. However, questions that ask the person to recall difficult operator or maintenance procedures may need interpreting or rephrasing. Interviews are especially useful when the reading skill of interviewees is low. Also, the more varied the target population, the greater the need to interpret and explain the interview questions.

A second advantage of interviewing is that the answers to questions can be clarified. This is usually necessary when a particular work activity can be performed in various ways. The interviewer can encourage the interviewee to give additional information that clarifies a previous answer. This allows for greater flexibility in the types of questions asked and is a good technique for increasing the possible range of answers.

A third advantage is that the interviewer provides greater control over the information-gathering situation. You are right there in control! When mailing out surveys and questionnaires, you lose some control because someone else is administering the survey for you.

A fourth advantage of interviews is that they provide an opportunity to determine if the information is valid and reliable. Information is valid if it is realistic in terms of the job being analyzed. During an interview you can tell if a worker is giving realistic information. You cannot control this when the worker completes a survey at some location miles from your office. Information is reliable if it is obtained over and over again from many different people. In other words, if you interview many workers and they all say about the same thing, you are getting reliable data. Because interviews allow you to clarify both questions and answers, you can constantly evaluate the reliability of the data you are collecting.

For all of these reasons, interviews are a particularly useful way to gather data. They are especially useful as a step in developing surveys, because they help ensure that the survey items are clear and complete.

Limitations of Interviewing. The quality of the interview is limited by the abilities of both the interviewer and the interviewee. The interviewer must be capable of planning, conducting and controlling the interview situation. Such skill comes through a good training program and experience. Interviewing may also be limited by the ability of the interviewee to communicate factual information. Untrained or unskilled workers usually cannot describe their job as well as skilled, experienced workers.

Usually, interviews are held with only a few people in each job specialty. If these people are not typical or if the specialty is very diverse, the picture that emerges from the interviews may not be very accurate for the job specialty as a whole.

Because interviews provide for flexible responses from interviewees, the information gathered from them cannot be combined and summarized as easily as that from surveys. This becomes a major problem when information from many people must be gathered and analyzed.

Finally, interviews are expensive. They require trained people to spend a large amount of time with each interviewee, as well as additional time and money in traveling to the interviewees. If interviewees are scattered all over the world, interviews become very impractical.

Advantages and Limitations of Surveys. Many of the limitations of interviews are advantages of surveys. Surveys are relatively inexpensive, they can be given to all the people in the job specialty or a random sample to get more complete coverage, and responses can be combined easily to get a good overall picture of the job specialty. They do not require highly trained administrators, although when good monitors give surveys, more and better information is produced.

Many advantages of interviews are limitations of surveys as well. For example, if the respondent does not understand the item, or if the survey is incomplete, information is lost, and that loss may not be known when results are tallied.

A combination of interviews, followed by surveys, uses the advantages of both methods while minimizing their limitations. Both the interviews themselves and the surveys that follow are critical steps in job task analysis. When you conduct O&I interviews, you are performing a key part of the process.

HANDBOOK FOR CONSTRUCTION OF TASK INVENTORIES

FOR NAVY ENLISTED RATINGS

APPENDIX F

ALTERNATIVE TECHNIQUES
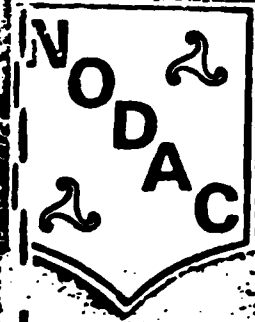
FOR POSSIBLE USE IN STEP 12

(CONSTRUCTION OF TASK INVENTORY)

ALTERNATIVE TECHNIQUES FOR POSSIBLE USE IN STEP 12

Six alternative techniques for task inventory development that may be appropriate to try out in Step 12, depending on the nature of the rating being surveyed, are described below. Pilot testing of the procedures is recommended to evaluate their suitability for use in constructing NODAC task inventories and for conducting occupational surveys of Navy enlisted ratings.

Blocking. The grouping of task statements and other inventory items into blocks can be a useful technique for organizing the contents of a task inventory if the blocking is done appropriately and the labeling of the blocks is accurate and comprehensive. Explicit instructions help the respondent skip quickly over blocks of items that do not apply to his or her work in the rating. The respondent can answer a blocked inventory more quickly and probably provides more carefully considered responses than those to a lengthy unblocked inventory containing many tasks that the the respondent does not perform. When blocking is used, a job incumbent should be able to respond to a maximum number of items in the amount of time allotted for administration of the survey. This may mean that the content of the inventory can be prepared at a greater level of detail and specificity than has been possible before.

To take maximum advantage of the blocking feature, titles or labels for the blocks should be included in the format of the task inventory so that the respondent can skip blocks that do not apply. However, choosing an appropriate title or label for a block is critical. If the title does not accurately and completely reflect all of the items in the block, the respondent may skip the block when in fact he or she may perform some of the tasks. Duty titles or block labels should begin with an action word ending in "ing" (gerunds)--for example, PERFORMING CORROSION CONTROL AND MATERIAL PRESERVATION. In addition to their use in guiding a respondent through an inventory booklet, duty titles or block labels aid the occupational analyst in identifying job groups.

The organization of United States Air Force job inventories relies heavily on the blocking feature, whether the block can be skipped or not. Common tasks which everyone in a particular Air Force specialty performs are placed at the beginning of the inventory, right after the Background Information section, and everyone responds to these initial blocks of items. Four Air Force duty categories that are common to all specialties represent natural blocks and appear first in USAF inventories. These four blocks are ORGANIZING AND PLANNING, DIRECTING AND IMPLEMENTING, INSPECTING AND EVALUATING, and TRAINING. (In Navy task inventories, probably the most suitable blocks to appear first would be those containing rating-related tasks that E-3s and E-4s are likely to perform rather than tasks at the supervisory levels.) How the remaining tasks are grouped into blocks in USAF inventories depends on the nature of the specialty and is left up to the judgment of the inventory developer. A group of tasks associated with a particular piece of equipment or system--for example, the F-16 aircraft--might be made into a

block that the respondent could skip if he or she did not work on that aircraft. At the beginning of this block of tasks, the respondent might be instructed as follows.

IF YOU DO NOT WORK ON THE F-16,
SKIP TO BLOCK X ON PAGE XX.

Examples of selected block labels from the USAF Navigational Aids Technician specialty job inventory are listed below.

● PERFORMING MAINTENANCE MANAGEMENT FUNCTIONS

● MAINTAINING TEST EQUIPMENT

● MAINTAINING RADIO BEACON SYSTEMS

● MAINTAINING INSTRUMENT LANDING SYSTEMS (ILS) NON SOLID STATE

● MAINTAINING LONG RANGE AIR NAVIGATION (LORAN) SYSTEMS

Other examples of the use of blocking can be found in a draft copy of an Office of Personnel Management (OPM) survey of apprenticeable trades. The examples sele :ed here are . 'r the welder and electrician trades. Portions of two blocks (DUTY C for welders and DUTY N for electricians) are reproduced below for their idea value.

DUTY C - TESTING, PREPARING AND CLEANING MATERIALS,
            EQUIPMENT, AND SHOP AREAS

Test metals for identification and classification using:

    1. a Spark test.

    2. a Heat and Quench test.

    3. a Chemical test.

    4. a Flame test.

    5. by non-destructive method.

  6. Cut heavy gauge metal stock.

  7. Cut pipe of various sizes.

  8. Cut various angles.

  9. Cut channels of many sizes.

  10. Cut I-beams or other metal extrusions.

  11. Bend parts by hot process.

  12. Bend parts by cold process.

  13. Shape and form parts by hot process.

14. Shape and form parts by cold process.

      •

      •

      •

23. Clean metal parts with sonic cleaners.

24. Prepare metal joints for welding.

DUTY N - PERFORMING ELECTRICAL INSPECTIONS ON NUCLEAR SUBMARINES, NUCLEAR AND NON-NUCLEAR SURFACE SHIPS

Inspect and document a variety of highly complex and sophisticated systems and components such as:

1. Electric power generation systems.

2. Missile fire control systems.

      •

      •

      •

7. Make visual and dimensional inspection reports.

8. Certify repair work

9. Witness, document, and verify reinstallation and complete the re-entry forms.

10. Document, certify, and audit sub-safe hull fittings for correct size, fit-up, material, torquing, and markings.

      •

      •

      •

15. Identify all items requiring correction prior to commencement of system tests.

16. Cross-check calibrated electrical instruments with portable standard instruments to insure system accuracy of very critical measurements.

17. Make "on the spot" controversial accept and reject decisions both orally and in writing.

18. Sign and document satisfactory and unsatisfactory inspections on legal work.

19. Plan and inspect systems and components to coincide with production shop's work.

20. Prepare a withhold report for critical deficiency, components, materials, and procedures when they do not meet specifications.

Notice that in the DUTY N block for the OPM survey of the electrician trade, there are many multi-verb task statements (for example, WITNESS, DOCUMENT, AND VERIFY; DOCUMENT, CERTIFY, AND AUDIT; PLAN AND INSPECT; INSPECT (or SIGN) AND DOCUMENT). The Office of Personnel Management takes a quite different approach to task analysis in that they use complex, multi-part task statements which are difficult for the Comprehensive Occupational Data Analysis Programs to analyze. In addition, the respondent becomes frustrated trying to decide on a single response when the answer to one part of the task statement may be yes, yet the answer to the other part(s) may be no. However, multi-part task statements can and should be broken down into multiple task statements, each having only one action verb and one object of the action verb. This would remove much of the objection to the OPM approach to task analysis. What is significant about the OPM examples is how they have grouped tasks into larger functional blocks or duties.

Equipment/Systems Matrix. The currently followed procedure in Section C of the Response Packet of having the task inventory respondent consider how often he or she uses (Section C-1) and repairs (Section C-2) a separate list of equipment/tools/systems makes it difficult during the process of analyzing inventory response data to relate the use and repair of equipment/tools/systems to the relative time spent performing the tasks (Section D) of the rating. If the functions performed for each equipment, tool, and system could be written as task statements, then it would be possible to analyze them along with all of the other tasks in the inventory using the Comprehensive Occupational Data Analysis Programs (CODAP). This would make the work of the NODAC occupational analyst a great deal easier and would result in a more meaningful description of the work of the rating.

At one time, the total number of items in a task inventory that could be manipulated at the same time by certain CODAP programs was 2000, and the total number of duty categories was limited to 26. These limitations placed a severe constraint on the level of detail and specificity that could be achieved in constructing a NODAC task inventory booklet. Now, however, a new version of CODAP (called CODAP System 80) has been prepared under the sponsorship of the DoD Executive Agent for Joint Task Analysis Support because of the limitations in the earlier IBM CODAP system that the United States Navy, Marine Corps, and Coast Guard had been using. The new system can accommodate any rating scale, not just relative time spent. In addition, the maximum number of items that can be included in a job/task inventory has been increased from 2000 to 5000, and the total number of duty categories (or blocks) is theoretically unlimited, constrained only by the maximum storage limits of the IBM computer being used to run the CODAP programs.

If the equipment/tools/systems (ETS) used in a rating were presented in a two-way matrix that listed the ETSs along one dimension (either horizontal or vertical) and the functions performed on these ETSs along the other dimension, a task statement could be derived from each combination of ETS and function. But, if the number of ETSs were large (say, 300) and the number of possible functions were 12, the resulting matrix would use up 3600 items of the 5000 total inventory items possible with the new CODAP System 80.

Clearly, that would not be an efficient way to collect ETS data in the high technology Navy anticipated for the future. But not all 300 items in the example mentioned above need to be or should be placed in the matrix format. All common tools and equipment could be extracted from the ETS list and organized as task statements in a single block. An example worked up from the April 1975 Electronics Technician (ET) task inventory booklet (the last survey of this rating) of a block of common tools and equipment might look like the following.

BLOCK X.   USING COMMON TOOLS AND EQUIPMENT

1. SCREWDRIVERS (SUCH AS JEWELERS, PHILLIPS, FLAT)
2. ABRASIVES (SUCH AS FILES, EMERY CLOTH, SANDPAPER)
3. WRENCHES (SUCH AS ADJUSTABLE, PIPE, OPEN END)
4. ALLEN WRENCHES
5. BRISTO WRENCHES
6. HAMMERS/MALLETS
7. LONG-NOSED PLIERS
8. SAFETY GLOVES (SUCH AS RUBBER, LEATHER PALM)
9. CLEANING SOLVENTS
10. VACUUM CLEANER   [perhaps with a qualifier/modifier]
11. MIRRORS   [perhaps with a qualifier/modifier]

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In addition, not all of the functions specified in the matrix format necessarily are performed for each equipment/system type. For example, if it was established during O&I that TEST and TROUBLESHOOT were the only two functions performed by ETs on Widgit XYZ, then two task statements could be written to cover these functions. When all common tools, and equipment/ systems limited to just a few functions have been removed from the initial list of 300 items in the previous example, the remaining number of items might prove to be quite manageable to present in equipment/systems matrix format. However, instead of using the equipment/systems matrix format with low technology ratings, the actual functions performed on each equipment/ system probably could better be written directly as task statements. Use of the equipment/systems matrix format with high technology ratings would require some very careful judgments in order to fit within the CODAP System 80 limit of 5000 total inventory items.

Figure F-1 shows one possible format for an equipment/systems-by-functions matrix for the ET rating in which both the equipment/systems and functions are defined. The reason for including definitions of the functions is to ensure that each function will mean the same thing to all respondents.

EQUIPMENT/SYSTEM FUNCTION	EQUIPMENT/SYSTEM ITEM				
	AN/VRC-80	AN/WRT-1 SERIES	AN/WRT-2 SERIES	AN/URC-32 SERIES	AN/WRC-1 SERIES
CORRECTIVE MAINTENANCE					
ADJUST/CALIBRATE - Change to match of fit requirements./ Adjust in accordance with a previously defined standard.	1.	13.	25.	37.	49.
ALIGN - Adjust, form or bring to a line.	2.	14.	26.	38.	50.
TEST - Measure performance, tolerances, etc. of equipment, machinery, etc. with special tools or equipment.	3.	15.	27.	39.	51.
TROUBLESHOOT - Evaluate a system or equipment to determine and isolate the cause of a malfunction.	4.	16.	28.	40.	52.
PREVENTIVE MAINTENANCE					
CLEAN - Rid of dirt, impurities, or extraneous matter.	5.	17.	29.	41.	53.
DISASSEMBLE/ASSEMBLE - Break down, take apart./Put together the parts of.	6.	18.	30.	42.	54.
INSPECT - Look at carefully; examine critically.	7.	19.	31.	43.	55.
LUBRICATE - Apply a lubricant (oil, grease, graphite, etc.).	8.	20.	32.	44.	56.
INSTALLATION/OPERATION					
INSTALL - Set up or fix for use or service.	9.	21.	33.	45.	57.
OPERATE - Put into operation or continue in operation.	10.	22.	34.	46.	58.
REPAIR					
REMOVE/REPLACE - Take an item from (off) and reinstall the same item, a replacement item, or a new item.	11.	23.	35.	47.	59.
REPAIR/OVERHAUL - Restore to working condition./Make repairs and adjustments to restore to working order.	12.	24.	36.	48.	60.

Figure F-1. One Possible Format for an Equipment/Systems-by-Functions Matrix in Which Both the Equipment/Systems and Functions Are Defined.

The inclusion of definitions can be expected to improve the validity of responses to task inventories. However, when function definitions are included in the matrix, they take up page space that could be allocated to additional columns for enumerating equipment/systems. The result of the trade-off shown in Figure F-1 is that only five equipments/systems can be surveyed per vertical page. Use of smaller type or photo-reduction in preparing the equipment/systems matrix template would allow room for additional columns of equipment/system items, but probably no more than seven or eight columns altogether or the print would be too small to read.

Perhaps the definitions for the equipment/systems functions only need to be stated once—in the instructions for that section or block of the inventory. If so, then it should be possible, using smaller type or photo-reduction, to place at least ten items on each matrix page. However, the respondents might forget the definitions and not refer back to them in the instructions. To refresh their memory, the definitions could be repeated intermittently, say, every fifth page, in the format shown in Figure F-1. Another possibility is to include the definitions in only the first five to ten pages and then to eliminate them, on the assumption that by then the respondents would have been exposed to the definitions often enough to remember what each one means. An additional possibility might be to use fold-back overlays of the definitions, visible for all pages of the equipment/systems-by-functions matrix.

Because responding to an equipment/systems matrix requires a different response set than that required for the rest of the inventory items, this section or block probably should be the last one in the booklet, preceded by the block of common tools and equipment and the block(s) of equipment/tools/systems that have been made into direct task statements. The last block then would be the equipment/systems matrix in which the most frequently used equipment and systems would appear first. The instructions at the beginning of the matrix block would show examples of how to mark on the appropriate page of the Response Packet (1) if the respondent assists in, performs, or supervises the function (secondary factors), and (2) the relative time spent in performing the task. The numbers in the cells of the matrix (see Figure F-1) would correspond to the task numbers of the columns in the Response Packet where the responses are marked. However, since no consumers of NODAC data appear to be using secondary factors information, it seems justified to consider omitting them to reduce the complexity of the decision for the inventory respondent and the time required to respond.

Another possibility in designing the format of the equipment/systems matrix might be to exclude the troubleshooting function from the matrix. The reason for considering this option is that troubleshooting of equipment and systems as a task is defined differently at different pay grades. E-3s and E-4s generally perform troubleshooting at the black box level, E-5s generally troubleshoot at the module level, and E-6s at the component level. Thus, as one moves up in pay grade, the job incumbent is expected to be able to troubleshoot at an increasing level of specificity in the system/equipment/assembly or module/component/part hierarchy. Organizational maintenance is performed at the equipment/system or black box level while intermediate

maintenance is performed at the module/component/part level. If it is desirable to capture these differences in troubleshooting tasks across the pay grades of a rating, then it makes sense to write a group of task statements reflecting these differences and to place them in a separate block called BLOCK X. TROUBLESHOOTING, or make TROUBLESHOOTING a major heading with subheadings for the three levels. This block also would precede the equipment/systems matrix.

If the equipment/systems matrix concept is ever pilot tested on a selected rating, it would be valuable to coordinate the development of the experimental task inventory booklet with a training importance survey of the same rating. If a training importance survey of the rating is under development by CNET or if one has been recently conducted, it is likely to have a more extensive equipment list than typical NODAC task inventories have. The training importance survey equipment list would serve as a good point of departure in developing an equipment/systems matrix for a NODAC occupational survey of the same rating.

Action Verb Lists of Task Statements. When a computer database of task statements exists for a set of task inventories, for a single task inventory, or for the duty categories or blocks of an inventory, it is possible to sort the database alphabetically by the action verb in the left-hand position of the task statement and to print the resulting reordered list of task statements. This rearrangement brings together all task statements in a duty category or block, an inventory, or set of inventories that begin with the same action verb. For example, if DAMAGE CONTROL were the duty category of interest, then an alphabetical action verb list for the NODAC database of task statements across all ratings might look like the following for the verb PERFORM.

11006   PERFORM DE-WATERING
HT3

11034   PERFORM EMERGENCY REPAIRS TO PIPING AND TUBING
HT3

11056   PERFORM NBC DECONTAMINATION
HT3

11003   PERFORM POST-FIRE DE-SMOKING
HT3

11065   PERFORM RADIOLOGICAL MONITORING AND SURVEYING
BT3   EN3   HT2   MM3

11028   PERFORM SHORING OPERATIONS
HT3

11030   PERFORM SOUNDING OF TANKS, VOIDS, AND COMPARTMENTS
HT3

11024   PERFORM WATERTIGHT INTEGRITY TEST
HT2

The leading 5-digit code in the list above is the number of the occupational standard to which the task statement corresponds. The rate(s) at which the task is performed is(are) listed under the number of the occupational standard. From this list of eight task statements it is possible to determine what most of the damage control procedures performed in the fleet are. Seven of them are performed by Hull Maintenance Technicians (HTs) since damage control is an important part of the work of their rating. Six of these seven procedures are performed by HTs at the E-3 pay grade level and one is performed at the E-2 pay grade level. The eighth procedure—radiological monitoring and surveying—is performed by job incumbents at the E-3 and E-2 pay grade levels in four ratings: Boiler Technician (BT3), Engineman (EN3), Hull Maintenance Technician (HT2), and Machinist's Mate (MM3).

The production of user-specified, alphabetized action verb lists by computer or by certain word processors is relatively easy, given that a database of task statements exists. Possible users of such lists might be the following.

- Task inventory developers when they are finalizing the list of task statements for an updated task inventory booklet.

- The NODAC Standardization Committee as an aid in their efforts to standardize the wording of task statements across ratings and pay grades and to map task statements onto their corresponding occupational standards.

- NODAC analysts who might be interested in seeing at a quick glance all the items for a particular occupational survey associated with such action verbs as, for example, HANDLE, INSPECT, PLAN, RIG, SERVE AS, etc. to provide clues for guiding the analysis process.

Noun Lists of Task Statements. The noun list technique for reordering task statements is the extension of a concept formulated by inventory developers at the USAF Occupational Measurement Center for standardizing the wording of task statements within an individual job inventory. The syntactic structure of a task statement is as follows:

ACTION VERB + OBJECT OF ACTION VERB (NOUN) + QUALIFIER (If essential to the meaning)

In the noun list technique, the action verb is moved to the end of the task statement, leaving the object of the action verb (or noun of the task statement) in the left-hand position. Now it is possible to alphabetize a list of task statements by their nouns rather than by their action verbs. If the database of task statements were large enough and had been accumulating over time, it would be possible to retrieve, for example, all task statements ever written that had CANOPIES, CATAPULTS, TORPEDOS, MINES, LOGIC DIAGRAMS, or whatever as their object.

In the USAF use of this technique, all of the preliminary task statements developed before O&I are reordered by their nouns (objects of the action verb), either for the entire inventory or by duty categories/blocks within the inventory. Since the USAF practice is, if at all possible, to write task statements for equipment/systems rather than putting them in a list, the alphabetical noun list for a job inventory under development pulls together all tasks related to the same piece of equipment or system. Any inconsistencies in how these tasks are worded are immediately obvious, and any functions that normally are performed for a piece of equipment or system which are not included in the list become an area to be probed during O&I.

For example, the alphabetized noun list for DUTY CATEGORY J – MAINTAINING INSTRUMENT LANDING SYSTEMS (ILS) NON SOLID STATE might bring together the following list of seven task statements pertaining to low frequency beacon (LFB) systems.

Item No.	Reordered Task Statement	Duty Category
21	LFB TRANSMITTER OUTPUT FREQUENCIES – MEASURE	J
22	LFB TRANSMITTER PERCENT OF MODULATION – MEASURE	J
5	LFB TRANSMITTER POWER OUTPUTS – ADJUST	J
23	LFB TRANSMITTER POWER OUTPUTS – MEASURE	J
9	LFB TRANSMITTER RF OUTPUTS – ALIGN	J
13	LFB TRANSMITTERS – INSPECT	J
31	LFB TRANSMITTERS – REMOVE OR REPLACE	J

After studying the noun list, the inventory developer might realize that certain tasks related to LFB systems had been overlooked in preparing the inventory. The developer then could add new task statements to cover these areas of omission as shown below.

LFB REMOTE MONITOR RECEIVER – ALIGN

LFB REMOTE MONITOR RECEIVER – ISOLATE MALFUNCTIONS

LFB REMOTE MONITOR RECEIVER – REMOVE OR REPLACE

A noun list like the one illustrated above can be used during O&I to make certain that the inventory covers all of the tasks that a job incumbent performs on a piece of equipment or system. Noun lists may also prove to be a useful aid to the work of the NODAC Standardization Committee and to NODAC occupational analysts.

A functional flowchart of the logic to be followed in preparing a computer program to produce a list of task statements sorted alphabetically on their objects (nouns) is shown in Figure F-2. Some action verbs consist of two words, with the second word being a preposition. Therefore, the second word of a task statement needs to be compared to a list of prepositions to decide whether to move just the first word or the first two words to the end of the task statement. When the action verb has been moved to the end of the task statement, it leaves the noun (object of the verb) in the left position of the task statement. Alphabetizing on the word in the left position then produces the noun list.

A preliminary list of prepositions is also shown in Figure F-2. Some of the entries in this list are not good action verbs. Nevertheless, they do occur in some NODAC task inventories. Any other prepositions that should be included in the list would be very apparent once actual noun lists were being produced since these prepositions would list in the left position of the task statement. Adding any prepositions found in the left position to the preposition list would take care of the problem.

KWIC Indexes and Text Editors. Other computer software is available to search and manipulate text in order to produce useful printouts of textual databases. Information scientists have long used Keyword-In-Context (KWIC) computer programs to produce permuted indexes. A KWIC index lists each substantive word or keyword in a prescribed segment of text, and each keyword in the segment becomes an entry point in a printed index. The keyword is positioned successively, that is, in the order of every occurrence in some body of text, in a fixed position which is the center of one index line. The keyword is surrounded on either side by the other words in the text segment to form one index line. An example page from a KWIC index to the Human Resources Research Indexing Vocabulary used in the Research and Development Information System at the Navy Personnel Research and Development Center is shown in Figure F-3. Task statements and/or occupational standards could be treated in a similar manner. In a KWIC index of task statements or occupational standards, the user would scan down the center column of words, which are in alphabetical sequence, to locate the word of interest, whether it be a verb, noun, adjective, or adverb. KWIC indexes of task statements and occupational standards would pull together similar task statements and/or occupational standards, and might be a useful tool in the work of the NODAC Standardization Committee.

Several versions of a KWIC index are available. The Defense Technical Information Center uses a KWIC program written in COBOL. The Research and Development Information System at the Navy Personnel Research and Development Center also uses one in COBOL, written for the IBM 370 computer.

Figure F-2. Flowchart of the Logic For Producing a List of Task Statements Sorted Alphabetically by Nouns.
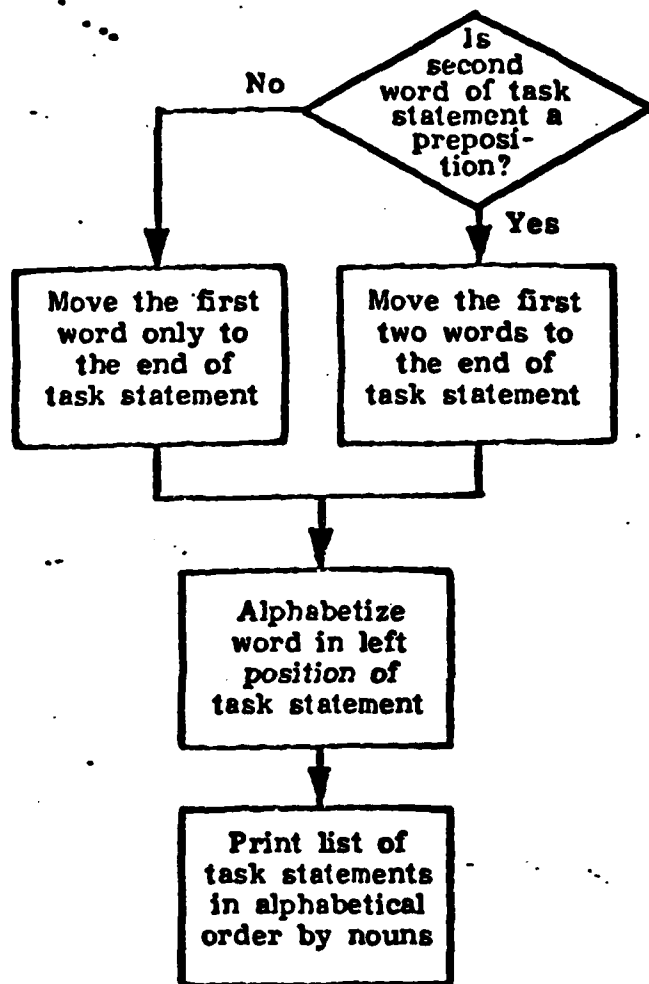
PRELIMINARY LIST OF PREPOSITIONS:

Act	AS
Stand	BY
Batten	DOWN
Account	FOR
Turn	IN
Cast	OFF
Roll	ON
Carry	OUT
Contribute	TO
Build	UP
Confer	WITH

Figure F-3.   Example Page from a KWIC Index to the Human
Resources Research Indexing Vocabulary.

Another useful tool for manipulating textual databases is a computer-based text editor. WYLBUR was the first flexible, truly interactive text editor to be created, and was developed at Stanford Unviersity around 1970. Powerful interactive text editors such as WYLBUR permit the user to interact with a database in order to retrieve, sort, and edit text. The Army Research Institute (ARI) is using WYLBUR to study a database of all task statements included in the Army's job inventories for military occupational specialties (MOSs) prepared during the last fiscal year. This database consists of approximately 20,000 task statements. ARI researchers can retrieve all task statements in this database containing, for example, the word TRUCK, CARBU-RETOR, AMMUNITION, MAPS, M16 RIFLE, etc. The objective is to discover the redundancy and overlap among similar task statements and to produce a body of standard task statements, many of which will apply to more than one MOS.

Another powerful text editor is the Conversational Monitor System – CMS/EDIT that runs under VS/370. The Computer Center of the University of Waterloo in Canada has expanded the capabilities of this text editor for IBM computers, and the software is in the public domain. Another text editor, designed primarily to be used by computer programmers, is the Programmers' Work Bench. This software was developed by the Bell Telephone Laboratories to run on Digit 1 Equipment Corporation (DEC) hardware.